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REMINERALIZE THE EARTH

Regenerating our soils, forests and health

RECYCLING MINERALS with finely ground gravel and rock dust

ISSUE 6 WINTER 1993-94 • NORTHERN HEMISPHERE

CAMERON THOMSON OF SCOTLAND FEEDS FAMILY OF SEVEN WITH REMINERALIZED GARDEN

IN THIS ISSUE:

U.S.D.A. SETS UP SR TRIALS

SR WITH SEA WATER

INTERVIEW WITH SAM CATALANO

VISIT WITH ORGANIC GROWER JOHN SUNDQUIST

SUMMER 1993-94 • SOUTHERN HEMISPHERE formerly SOIL REMINERALIZATION NEWSLETTER

REMINERALIZE THE EARTH

Regenerating our soils, forests and health

Recycling minerals with finely ground gravel and rock dust

This magazine is a reflection, forum, round table of ideas, experiences and research of those concerned with networking and implementing soil remineralization. Articles, letters, and photos are welcome and appreciated. We reach an emerging grass roots community network around the world.

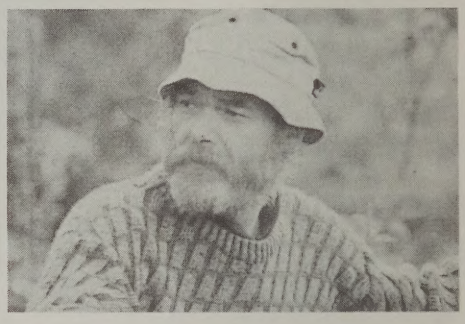
EDEN OR ICE AGE
Which Will We Choose?

The book *The Survival of Civilization* by John Hamaker and Don Weaver is regarded by a growing movement worldwide as a blueprint for the survival of the Earth, restoring ecological balance and, perhaps, even recreating Eden.

The remineralization of forests, farms, orchards and gardens with glacial gravel and rock dust is nature's way to regenerate and fertilize soils. During an Ice Age, as glaciers grind rock to a fine dust over millennia, a fertile soil is created. Adding finely ground gravel dust to soils is a tremendous boost to organic agriculture and can make it truly viable by adding up to a hundred elements and trace minerals needed by all life and by nourishing the microorganisms in the soil, whose protoplasm is the basis of all living things.

There is evidence to suggest that as forests begin to die off worldwide, giving off carbon dioxide, the climate of the Earth is altered, triggering the transition from the warm interglacial to an Ice Age. We are hastening this process with the burning of fossil fuels. Undertaking the task of remineralization is urgent to restore our agricultural soils and to save the dying forests in the temperate latitudes and stabilize our climate.

On the Cover



Cameron Thomsom on his farm outside Dundee, Scotland, chest-high amid his cabbages, does a minimum of garden maintenance after treating it with 20 tons of rock dust. See story on page 24.

Cover and article photos by Colin McPherson.

Publisher/ Editor: *Joanna Campe*
◆ **Associate Editors:** *Liz Mikulecky and Janet Scott* ◆ **Layout:** *Joanna Campe, Liz Mikulecky , and Willow LaMonte*
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152 South Street, Northampton, Massachusetts, 01060 U.S.A. Tel.: (413) 586-4429, ISSN 1066-4106, aims to publish three times a year. **Subscription rate** is $15-$25.00 (sliding scale according to income and/or enthusiasm) for First Class for three issues in the U.S. and $25.00 outside the U.S. For more subscription information see inside back cover. Printed with soybean ink on recycled paper by Alonzo Printing Co., Inc.

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From *Remineralize the Earth*

Highly Newsworthy

Most exciting news of this issue: the U.S. Department of Agriculture is setting up field trials for remineralization in Beltsville, Maryland under the direction of Ron Korcak. See page 21.

Promising, but still Rumors

A great vision with a sound business plan can lead to a dream come true. A few companies may soon receive investment capital to get SR off the ground in the form of joint partnerships. A non-profit foundation might be created to help promote remineralization around the world. This would assist in getting an international conference underway on SR. Many other possibilities are in the air, not quite anchored enough to be announced officially at this time. Once these possibilities land on firm ground, they will be reported on in upcoming issues.

Transitions

Staff member Willow LaMonte, a New England gardener for over twenty years, is moving to the island of Malta in the Mediterranean, where she will continue to do her Goddess and gardening work in a land where there is no word for snow in their language!

We'd like to welcome Liz Mikulecky who has just joined the staff of ***RE.*** She has most recently been working with the Schumacher Society in Great Barrington. She had recently moved back to western Massachusetts, after a few years living and working on the island of Kauai in Hawaii.

New co-editor Liz Mikulecky remineralizing her garden in Shutesbury, Mass. with local traprock from The Notch quarry.

Yvonne Rado with distributor Roger Kahane of Cottage Grove, Oregon with with a bag of Rado Rock.

A Fond Farewell to Rado Rock

In the last ten years many have come on the remineralization scene. Although there were a few companies in the U.S. who had sold their rock dust for agriculture for several decades, Yvonne Rado was one of the first to be influenced by the work of John Hamaker and Don Weaver. Yvonne has been a pioneer in the northwest creating a product for national distribution with her glacial dust Rado Rock. After many challenges in the business world, she feels the need to retire her product from the market. We hope that she'll consider re-entry at some point in the future. We will miss her and wish her the very best.

Joanna Campe

"Guided By A Global Vision"

A "Biological Time Machine"

For the past 10,000 years, since the retreat of the West Coast glaciers, the Klamath Lake basin has served as a "nutrient trap" for a rich supply of minerals, volcanic silt, organic plant matter and other biological treasures washed in from over 4,000 square miles of its mountainous surroundings. And the unique plant at the heart of this ecosystem - *Aphanizomenon* (rhymes with "phenomenon"), dubbed "Super Blue Green™" - formed the core of what was to be an exceptional line of natural food products.

Birth of the Cell Tech Vision

In 1983, this extraordinary environment inspired a visionary idea. In the decade since we have grown into a multi-million-dollar company with a global vision of health, energy, integrity and planetary success, employing over 100 locally and marketed throughout North America and the world.

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Daryl Kollman

Cell Tech's mission does not stop with producing and distributing a line of unique food products. Cell Tech's purpose is to create a generation of leaders, guided by a global vision of health, environmental integrity and economic abundance. To share "The Algae" and the Network Marketing opportunity with the greatest number of people in the shortest possible time.

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Soil Remineralization and the Climate

As Ward Chesworth and co-researchers write in *Agricultural Alchemy: Stones into Bread:*

"Our most optimistic expectations are no less than the realization of an old dream: What will fertilizing with stone dust accomplish? It will turn stones into bread... make barren regions (fruitful) (and) feed the hungry."

Julius Hensel
Bread From Stones (1894)

Soil Remineralization

The soils of the entire world have become severely demineralized by erosion over thousands of years. Plants require a continuous intake of minerals, just as we do, and for very similar reasons – calcium to build structural support, iron to carry oxygen, and so on. Plants growing on mineral-depleted soil do not get enough nourishment and so become smaller, less-abundant and less hardy, more vulnerable to the insects, worms and fungi that prey upon them.

Remineralization causes a phenomenal growth of the microorganisms in the soil. It increases the nutrient intake of plants. It counters the effects of soil acidity, prevents soil erosion (just for that reason it would be worth applying rock dust), increases the storage capacity of the soil, contributes to the building of precious humus complexes, has anti-fungal properties, and when you spray it on plants it repels insects as well. The plants and trees become highly resistant to insects, disease, frosts, and drought. Remineralization also enhances and speeds up the process of composting, so if you are composting for your garden, consider putting on some rock dust. It can be even more effective than just directly applying compost to the land.

The above information is condensed from the writings of John Hamaker, Don Weaver, Larry Ephron and Joanna Campe.

For Forests

The results of long term experiments released in 1986 showed that *in a forest where pine seedlings were remineralized, after 24 years the wood volume was four times higher* than in the untreated area.

Recent remineralization trials of a dying forest on Mt. Mitchell by Dr. Robert Bruck, Ph.D., *showed 12 weeks after application of rock dust, height growth of red spruce was increased by 27% over non-treated controls, and height growth of Fraser fir was 19% greater* than the untreated controls. (*Forestry Research* packet p. 9)

The Men of the Trees organization in Australia is doing remineralization trials with many species of trees in Australia with phenomenal results, *such as five times the growth of tree seedlings of one variety of eucalyptus, over the untreated controls.* (See *Forestry Research* packet p.17)

For Agriculture

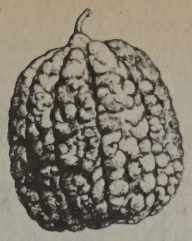
The best source of soil minerals is simple crushed gravel dust. In 1976 John Hamaker spread gravel crusher screenings on part of his ten acres in Michigan. The following year, in an area of sparse rainfall and dry summers, *and with no irrigation,* his corn produced 65 bushels per acre, compared to yields of under 25 from other local farms.

Moreover, when independent analyses were done, Hamaker's corn was found to contain 28% more protein, 47% more calcium, 57% more phosphorous, 60% more magnesium and 90% more potassium than the same type of corn grown with chemical fertilizers nearby.

Twenty years ago the USDA published studies which showed that cement kiln dust (a less-satisfactory source of minerals) also produced better crops, but they couldn't understand "what element" in the dust was responsible and dropped the matter.

Don Weaver grew 18-foot pole beans on remineralized soil (Jack and the Beanstalk?) and got *two to four times the normal organically grown yield.* Alan LePage of Vermont grew a crop of carrots averaging 1-1/2 feet long. And there was no insect damage to any of these crops.

Hamaker estimates that on fully remineralized soil, American agriculture could grow *four times* as much food as it is capable of now – or the same amount of food at about one-fourth the cost – and with no pesticides or chemical fertilizers.



The Nutritional Aspect

When we eat food grown on depleted soil we too, like the plants, lose our natural resistance to disease. All the degenerative diseases have been on the rise in America in recent decades. Dietary fat, cholesterol, salt and overly-refined foods seem to be major factors, but a serious deficiency of minerals in our food may be another. Mineral depletion of soils has been found to be directly correlated with death rates. And deficiencies of only one of a number of trace minerals – copper, iron, selenium, etc. – have been found in laboratory studies to be associated with an increased risk of cancer. You may want to grow more complete, nourishing food for yourself and your family.

A Global Perspective On Climate

The problem of soil demineralization also has a global perspective. It is known that the Earth's soil becomes demineralized during each interglacial period, the relatively short 10,000-year warm period between each 90,000-year major Ice Age. Consequent decline and death of the world's forests and other vegetation which occurs causes great quantities of carbon dioxide to be given off. The level of carbon dioxide in the Earth's atmosphere has been rising exponentially for the past century. Carbon dioxide and other greenhouse gases trap excess heat from the sun, potentially affecting the world's climate.

It is also well-known that when the glaciers advance and then recede during each recurrent Ice Age, they grind down rocks in their path, and this mineral-rich dust is blown far and wide over the surface of the Earth, remineralizing soils and causing plant life to thrive again.

John Hamaker has supplied one missing piece of a cosmic puzzle to provide an explanation, long sought, of the awesome 100,000-year cycle of major Ice Ages. Hamaker points out that the greenhouse effect occurs primarily in the tropics, which get the most sun, rather than in the polar regions which get very little. When this happens, the temperature differential between the tropics and the poles increases, resulting in fierce wind systems, hurricanes, tornadoes and storms.

The moisture picked up by these increasing storm systems also is transported to the higher latitudes, where it gets deposited as snow and ice, eventually bringing on glaciation and the next Ice Age. This has been happening in recent years, with record snow cover in the Northern Hemisphere and a shortening of the growing season, by weeks in some places, a pattern which is also accelerating year by year. Hamaker estimates that within a few decades the growing season may have decreased so much that millions of people will starve, in the richer nations as well as the poorer.

Remineralization of the world's soils and forests will store carbon and contribute to climate stability. By assuming the task of remineralizing the Earth's soils, much as the glaciers do during an Ice Age, we can create fertile soils and abundance. We can re-create Eden.

Letter from RE Editor to the Newsweek Editor

Thank you for your breakthrough article on climate, "The Return of the Glaciers." It's about time John Hamaker's work received national attention. The magazine ***Remineralize the Earth*** has been advocating remineralization for six years.

Hamaker estimates that on fully remineralized soil, American agriculture could grow four times as much food as it is capable of growing now – or the same amount of food at about one-fourth the cost.

The Hunza people in the Himalayas irrigate their fields with glacial till and have been the healthiest people in the world. Recycling the minerals and trace elements back into our soils and food with finely ground glacial gravel (or similar mixture), would cut health care costs dramatically.

One forestry study showed four times the timber volume on remineralized soil than in the untreated area. The military could remineralize our forests and many jobs could be created.

Remineralization could return us to early interglacial conditions, a time of great abundance. Without it, the earth's soil mantle is so demineralized, it is losing its ability to support productive life and we'll be leaving the task of remineralization to the glaciers. Eden or Ice Age – which will we choose?

Joanna Campe, Editor
Remineralize the Earth magazine
Northampton, Mass.
November 23, 1992

A Rock Dust Primer

◆ **Quotes and Gems**
by John Hamaker
from the book
The Survival of Civilization

What Type of Rock Is Best?

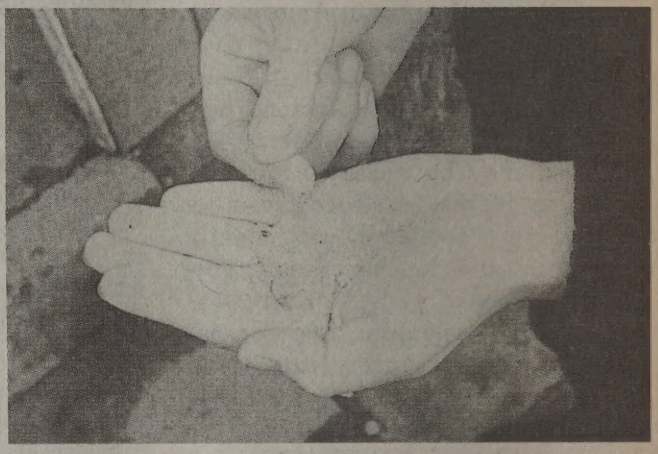
Feeding poor soil with mixed rock dust may be compared to feeding an ill person a varied diet of unrefined, natural food. If no one single food is a panacea, it might follow that no single rock type is "ideal." Indeed, the virtue of glacial gravel is said to lie in its broad spectrum of rock types. Hamaker advocates the use of glacial gravel dust, ideally followed by river and seashore gravels and mixtures of single rock types.

John Hamaker in the book *The Survival of Civilization* suggests finely-ground glacial gravel because that is nature's way throughout millennia to create fertile soils. Glacial gravel, which is a natural mixture of rocks, will create a broad spectrum of minerals in the soil in a natural balance.

Much of value can be gleaned from Europe and the research and experiences there (where single rock types and combinations of single rock types are used.) Hamaker's approach, however, may very well offer an even greater potential for an ecologically sustainable and sound agriculture and forestry.

Does It Need To Be a Special Kind of Gravel?

Again, the analogy of feeding soils to feeding humans is pertinent. From simplistic notions of human dietary requirements as straight protein-fat-carbohydrate ratios, our understanding of specific human dietary needs has grown to staggering sophistication and complexity, and we are now learning that what we don't know may exceed what we do. Similarly, we have come a long way from the simple NPK idea. But no amount of controlled research has conclusively told us (or likely will ever tell us) precisely which minerals specific plants really need and in what precise proportion. The attempt to second-guess nature in all her complexity is sure to be a futile and perpetual game of catchup.



Hamaker asserts that:

"Microorganisms select what they need to make the compounds of life, and reject to the subsoil what is not needed, [such as] aluminum, silicon, iron, etc., which are generally in excess [in gravel dust]," further pointing to "the Kervran research on biological transmutations", which suggests that biological organisms may play an active role not only in selecting specific elements, but also in modulating their elemental nature to create needed materials where they are in short supply. Hamaker says:

As long as the soil is neutral [in pH] or close to it, microorganisms will control what goes into the plant roots. These controls are off when the soil is acid or acidic chemicals are added.

Composting With Rock Dust

Combining gravel dust with organic materials in compost is a great way to solve application problems and speed up the process. Don't forget a handful of soil to innoculate with organisms. Gravel dust improves aeration and structure and therefore prevents rotting. Gravel dust is assimilated even more quickly in compost than in poor soils.

Compost and gravel dust are a symbiotic combination: the compost provides an excellent medium for the "microorganism population explosion" promoted by the dust, and the gravel dust will not only help create more organic matter, but will also help hold it in place, reduce odors and conserve it.

Add 2-20 lb. of rock dust per cubic yard of compost, if one is doing pile or window composting.

Soil Acidity

Soil pH should be measured annually. If the soil is acidic, agricultural limestone may be added together with the rock dust to bring the soil pH to neutral. Gravel dust will also neutralize soils to a great degree, but limestone is a quick remedy for agricultural soils. Limestone is not recommended for forests as it will destroy the humus-building complex over the long term.

Approximate Application Rate Conversions

3 tons per acre =	14 lb. per 100 sq. ft. =	1.25 lb. per sq. yd.
10 tons per acre =	46 lb. per 100 sq. ft. =	4 lb. per sq. yd.
20 tons per acre =	92 lb. per sq. ft. =	8 lb. per sq. yd.

Particle Size Conversion

Particle	Diameter (microns)	Mesh
Fine sand	250 – 100	50 – 125
Very fine sand	100 – 50	125 – 250
Silt	50 – 2	250 – 6000
Clay	2 or less	6000 or more

Keep Insects In Natural Balance In Your Garden

For short-term rescue, very fine dust sprayed directly on plants and trees has been shown in research in Germany to deter insect infestations very effectively. Trails of rock dust around the garden help keep slugs out. And healthy remineralized plants will not be plagued by insect infestations in the long term.

How To Apply Gravel Dust

There are many ways to apply dust to the soil; which method you use depends on the scale and your preference. It can be spread by hand out of a wheelbarrow, or rototilled and disked in. Farmer John Sundquist applies it with a manure spreader, bander or an "E-Z Flow" type fertilizer applicator. He also uses rock dust in a potting soil made of compost, ashes and peat moss.

How Much To Use

◆ *A grower of crops or a gardener needs a good response the first year after a fall application. The response in any one year depends on the amount of minerals available to the microorganisms, soil moisture and the amount of inert organic matter.*

◆ *If the last two factors are satisfactory, as little as 3 tons of gravel dust per acre worked into the top 4 inches of soil should give good results. However, I prefer about 10 tons per acre worked in about 8 inches, since one application will eliminate the cost of a number of more frequent applications and give high yields.*

The Application Conversion chart above will help you to determine how much gravel dust to use: 3 tons per acre is considered the minimum application, 10 tons per acre is Hamaker's preferred long-term application, and 20 tons per acre is given as a major remedial application, for especially dry, poor soil. Smaller amounts are recommended if the rock dust is finer than 200 mesh.

Finding Local Gravel Dust

To find Gravel grinding operations in your area, call your local gravel pit (look in the *Yellow Pages* under Cement-Wholesale, or Sand and Gravel) and ask if they have crushed gravel screenings made from mixed rocks, the kind that comes out of river beds – crushed and passed through a 1/4 inch or finer screen. The gravel dust will probably cost from $1-$8.00 per ton plus the cost of transportation if the gravel pit delivers it to your garden. As most of the cost is in transporting the rock dust, having a truck or access to one is an advantage. A cooperative initiative with friends and neighbors would also cut costs down.

The Particle Conversion Chart shows various categories of "soil separates" (ground particles) listed with their diameters in microns (thousandths of a mm.) and their corresponding screen mesh sizes. "Mesh" simply refers to a screen with a given number of holes per inch.

The more finely ground the rock, the more readily microorganisms will have access to the minerals. John Hamaker uses the term "gravel dust" to mean a dust "90% of which will pass through a 200-mesh screen."

Testing Your Gravel Dust

◆ *Several people have reported to me that gravel dust does not work or it will have [only] a temporary effect. They don't describe the dust in detail, but I suspect they had very little dust in what they call 'dust' Know what you are buying or you may be badly disappointed.*

Here are three simple, quick tests you can perform at home:

Pot Test: A pot test will give you immediate, practical proof of what the product will do in the soil. It is a good idea to add the gravel dust to clay pots and plant radishes or other fast growing plants and observe their progress. As John Hamaker writes:

◆ *Doing a pot test is the most convincing argument I know of. Anybody can do it. There are testing laboratory grinders everywhere. There is no lag time. In 6 hours you can get a microorganism population explosion. Taking some 6" clay pots, I filled them with a 50-50 mixture of earth and peat and 3 heaped tablespoons of dust. The results were astonishing!*

You can compare different mixtures or samples of gravel dust depending on what's available in your area. Use a control without rock dust to compare as well. You can also begin with small plots in the garden. You can see the results of the gravel dust you've chosen and then add it in larger quantities to your garden. Work the gravel dust into the topsoil, if possible.

Separate Layer Test: Purchasing a product based on its stated screen mesh alone still leaves room for error. A purchase of 90% or even 100% 200-mesh screenings could contain only sand and silt, and no true dust. A separate layer test will tell you approximately how much of your "dust" is really dust and will be suspended in water.

Fill a clear glass half full with your sample and cover it with about two inches of water. Shake it up vigorously, then allow it to settle overnight. The dust, silt and sand will settle into three distinct layers with the dust at the top.

If the container is allowed to stand until the water has dried out, the dust [topmost] layer will shrink to about 1/3 the original measurement and give a more accurate percentage of the dust. Your first observation, however, will tell you if you are buying mostly sand. The coarser the grind, the less effective it will be in the soil, and the more you will need to use per acre.

Moisture Test:

◆ *If the material is bought by the yard, there is a probable increase in bulk when wet...The buyer needs to test so one can know the actual weight of dust one is applying to the land.*

Take a sample, weigh it, then dry it thoroughly in the oven [and reweigh it]. This will tell you how much of the weight you are buying is moisture.

Chemical Analysis

In most situations, having a formal chemical analysis made is probably going to unnecessary trouble. A pot test and small-scale trials with fast-growing plants will give you more accurate information and with less expense. In cases where you have doubt about its source, you may wish to have a gravel dust analyzed to ensure that it is free of radioactive elements and toxic industrial by-products. In most cases your source will have already had to undergo such testing in order to get a license to operate. This is worth some homework. If you are not able to obtain documentation to your satisfaction, it might be wise to go ahead and obtain your own independent lab tests. Good testing labs are listed in the *Gravel Sources* section.

More Tips From Hamaker

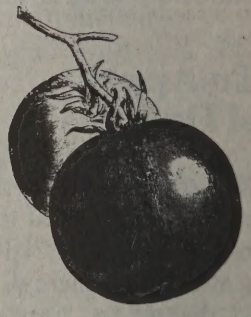
◆ *One other thing might be useful. I put about 2 inches of sand on our garden before plowing. It will last a long time and give some yield after the dust is used up. I am sure it has been contributing to what we grow. Unscreened sand (preferably fine sand) from a local gravel pit is much more economical than shipping dust which is mostly silt and fine sand.*

◆ *Sometimes the gravel pits have mesh screens and can measure the exact fineness of the gravel. Though it may be hard to find the ideal fineness – 90% passing through a 200-mesh screen – it may be practical to use even if only 20% or so passes through a 200-mesh screen and at least 50% passes through a 100-mesh screen. You will have the finer material immediately available to the soil and the rest will break down over time. If most of it passes through a 200-mesh screen, it will have a fine consistency like flour or cement. The gravel pit may have machinery to crush the rock finer and may crush it for you.*

Soil erosion is an effect of the shortage of minerals available to support the soil organisms. As Hamaker says,

◆ *That shortage can be made up on any piece of land in the time it takes to work ground gravel dust into the topsoil. When that is done, the soil microorganisms begin to multiply and it is they who prevent soil erosion by granulating the soil and holding it against both wind and rain.*

For a more thorough understanding of remineralization, read Hamaker and Weaver's *The Survival of Civilization* and order the Research Packets found in the *Resources* section of this magazine.



We would like to know what results you get from remineralized soil, so that we can improve our knowledge and data-base. Please call or write us. Photos with written reports are welcome and an important contribution to our network. Thank You!

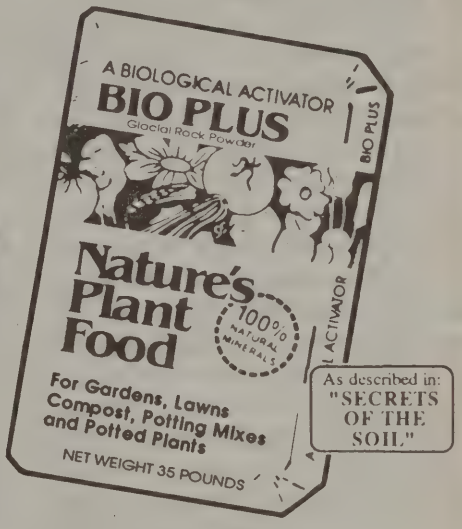
(100%) Natural Multi-Mineral

BIO PLUS™ Glacial Rock Powder

DISCOVER NATURE'S SECRET FOR HEALTHIER PLANTS AND CROPS

Rocks are the parent mineral source of all soils and are constantly being made available by slow weathering. . . *very* slow weathering. Rock weathers at a rate of one inch every 9,000 years, therefore it is not unusual for plants to use up rock minerals at a much faster rate than they are made available. **BIO PLUS™** has found a way to provide the ***same vital minerals and nutrients as nature*** in a much shorter period of time. One quick application of **BIO PLUS™** provides nutrients for your plants that it would take nature thousands of years to provide.

Leaching and long-term harvesting have stripped today's soil of many of the vital glacial minerals needed for healthy and abundant plant growth. **BIO PLUS™** Glacial Rock Powder instantly replenishes soil with the minerals and nutrients found in glacial rock.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Glacial Rock Powder
BIO PLUS
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100% NATURAL MINERALS
For Gardens, Lawns Compost, Potting Mixes and Potted Plants
NET WEIGHT 35 POUNDS
As described in: "SECRETS OF THE SOIL"

As a result, **BIO PLUS™** *Superactivates Soil Microbes and . . .*

- Creates **bumper yields**
- **Builds nutrients** in the soil faster than plants can use them
- Provides **72 vital nutrients and trace minerals**
- Balances soil
- **Speeds composting**
- **Increases** growth of **micro-organisms**, resulting in increased plant nutrients
- **Increases** natural **nitrogen** fixation
- Helps plants and crops fight off harmful pests
- One application continuously **releases minerals** throughout entire season
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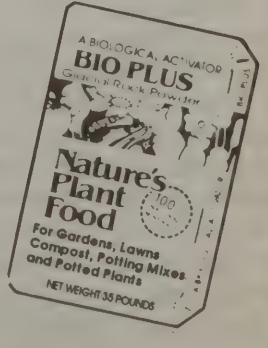
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MONITORING NATURAL SOIL PROCESSES

by George Leidig

Although many growers today are striving to make the transition away from chemicals and back to more natural fertilizers and cultivation practices, there are some very difficult questions that arise along the path. What is "natural" and how do I monitor that in my soil? For what should I test, and what am I actually feeding, the plant or the soil? These are all questions that every farmer, gardener, or nurserykeeper needs to ask him or herself. In attempting to answer these questions, we must however first dispel the long standing organic myth: that there is something out there called "natural" farming.

Agriculture, by definition, is a very unnatural process. You just aren't going to see mile-long rows of hybrid corn or plowed under fields of sod anywhere in nature. We may however first observe nature and her processes before working the soil, and from there try to emulate the same into modern farm practices, minimizing our negative impact on the soil and non-renewable resources.

Most of us are now aware that sustainable soil fertility is multi-faceted – being biologically, chemically, and physically driven in nature. It is the integration of these three things however, orchestrated by soil microbes, that completes all nutrient cycles and constitutes truly renewable agriculture. Soil life is the engine that drives the regulation of all these processes. The millions of bacteria and fungi present in every gram of a healthy soil are virtually the servants of the plant and animal world, being the beginning and end of the food chain by controlling both growth and decomposition.

Microbial action steers organic materials such as nitrogen, carbon, and sulfur compounds, along with all of the inorganic minerals needed for life, along the path from fixed to available and then back again into storage. Everything governed by nature is cyclical. The re-establishment of nutrient cycling is our paramount goal. We must learn to reconnect this delicate balance that we in agriculture have disturbed.

The arrival of NPK agriculture and intensive farm production methods brought on the dissolution of nature's method of biologically-available nutrients. Our organic fertilizers have been replaced with those that are chemical or water soluble. Farmers stopped feeding the soil and began attempting to directly feed the plant. Food, in this instance, is more or less being grown hydroponically. Chemical fertilizers are applied to the soil in the form of water-soluble mineral salts. Once applied, it is hoped that enough moisture gets into the soil so that these mineral salts may dissolve and get down into the plant roots. Laboratory conditions have shown that the plant can uptake these major nutrients and grow. Out in the field, however, the farmer encounters less than ideal laboratory conditions, and it is here where this water soluble theory has become both inefficient and dangerous.

Studies have shown that chemical fertilizers are about 70% inefficient, meaning that only about 30% of the fertilizer ever makes it to the plant.

What is "natural" and how do I monitor that in my soil? For what should I test, and what am I actually feeding, the plant or the soil?

The rest of this so-called plant food then leaches out, causing imbalances in the soil, adversely affecting pH, etc. This might be great for the chemical companies trying to sell more fertilizer but not so lucky for the rest of us; the excess usually ends up contaminating surface and ground waters, wasting non-renewable resources and compromising our food quality. Even raw manure application can lead up to 80% losses. When humus and organic matter are burned out of the soil, nutrient and mineral recycling are further halted. This has a compounding effect.

We see from nature and our own common sense that the preferred method of fertilization is to feed the soil, but in many cases it is unclear what is going on in the soil. There are many farmers these days going back to applying "soil foods" in the form of natural rock powders and other products, but they are not seeing the desired crop response. In these cases, they are still bouncing along the water-soluble road and

have not been able to reestablish the biological activity necessary to make these slower release nutrients available. Their soil biology has probably degraded too far and they now need some way to jump start the system, either with good compost or an inoculated green manure.

The first place to start in soil rebuilding is with organic matter management. Although this might seem the simplest in theory, it is the hardest in practice. Many farmers still do not understand the importance of organic matter. It is not something you buy out of a fertilizer bag and it is difficult to see its immediate financial gain. Organic matter management is a long process, which includes acknowledging the existence of, and feeding, the soil life.

Farmers stopped feeding the soil and began attempting to directly feed the plant. Food, in this instance, is more or less being grown hydroponically.

According to figures published on the American farm, average organic matter levels have fallen to about 1 1/2%, which doesn't leave microbes with much of a diet. Two percent organic matter is considered a minimum bank account reserve by many soil biologists. It is the smallest amount a soil can possess and still function properly. When you compare this with the numbers we should be seeing out there, such as 5% organic material levels on good organic fields, 8% for permanent pastures, and even as high as 10-14% for garden soils, then you realize how much farther we have to go.

The problem today with soil testing is that farmers still cannot predict from them what is going to happen to these nutrients when out in the field. In reality soil tests are far from perfect and it is only through a combination of analytical testing and on-field observation that the total picture of soil fertility can be integrated together.

Recently I had the opportunity to visit a successful vegetable grower who had been farming organically for several years. He told me that he doesn't even look at soil tests. He just pays careful attention to soil structure and organic matter enrichment through composting, green manuring, and proper tillage techniques.

A sentence out of a respected book on ecological soil management came immediately to mind, "While it is possible to promote healthy soil by carefully managing organic matter and humus with little regard for balancing minerals, the reverse is rarely true." What this tells us is that if we take care of the majors, the minors will take care of themselves, which is exactly what this successful farmer managed to do. With proper organic matter and humus levels in our soil, we can almost guarantee that the availability of the needed nutrients will be delivered to the plant when, how much, and in what form they are needed.

Another dilemma is that the term "available" on lab reports tends to mean water soluble, and there isn't any standard method to tell you whether or not non-soluble nutrients being added to the soil are released and assimilated by the actions of microbes.

A perfect example: organic matter can be easily added at a rate of several tons per acre in the form of green manure, crop residue, manure, or compost. However, there is no assurance that it will ever be transformed into humus. This is why the soil test procedures we do test for humus and organic matter separately. From there we look for a certain ratio between the two, which signals that there is or is not proper nutrient cycling in the soil.

Another test that we like to use for both composts and soil is filter chromatography, a method developed by Dr. Ehrenfried Pfeiffer some 50 years ago. In this procedure we take a ground soil sample and dissolve it in an alkaline extraction solution. The extract is then wicked up into a special filter paper treated with silver nitrate, a photo reactive substance. After this filter disk has had time to develop, it can be used to determine many aspects of the soil. Although it

continued on page 35

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University Trials in Madurai, India

Dr. T. N. Haridasan of the School of Energy, Environment and Natural Resources at Madurai Kamarajar University, Madurai, India, has begun studies on the effect of remineralization on chosen tree species of forest plantations. Dr. Haridasan will be doing the studies in the Tamil Nadu region of India, and the trials will last three years.

The objectives of the studies are four-fold – first, to study the effect of rock dust application on growth performance, physiology, pests, and development of in-built resistance to drought of various species used in an afforestation programme; second, to study the leaching pattern of various types of rocks resulting in high growth response in forest plantations; third, to find the effective mode of gravel dust application to various forest species in various stages; and fourth, to optimize the particle size of the dust causing high response.

RE hopes to be kept informed of the progress and results of these trials and will pass along that information to our readers.

Mica Research in Sri Lanka

An agrogeologist in Sri Lanka is studying the benefits of different types of rock dust as soil fertilizer. Dr. Tara Weerasuriya of the Institute of Fundamental Studies and the Department of Geology at the University of Peradeniya, Sri Lanka, is focusing on residual products of the mining industry, specifically mica concentrates, as **SR** products.

Dr. Weerasuriya says that the response to mica clearly shows a multinutrient deficiency in highly weathered tropical soils. Mica's relatively high solubility, its range of nutrient supply, its dryness, and its extremely simple manufacturing process make it a cheap but effective fertilizer for the tropical regions where nutrient deficiencies exist.

In addition to her work in Sri Lanka, Dr. Weerasuriya is working on developing an SR project in Canada. Her proposal focuses on the bio-geo-economics of using rock dust as a multinutrient ameliorant to re-establish nutrient balance in ecosystems damaged by continued use of highly soluble super-concentrated salt-based fertilizers and attendant pesticides.

RE Presents at Conferences

RE Editor Joanna Campe recently attended and presented information on SR at several conferences. The first conference was the annual meeting of the American Society of Agronomy, the Crop Science Society of America, and the Soil Science Society of America in Cincinnati, Ohio on November 7-12, 1993. She and The National Aggregate Association were invited to have a speaker and poster session by W. D. (Doral) Kemper of the U.S. Department of Agriculture. Joanna Campe networked and participated in a poster session along with Robert Able of the National Aggregate Association and Timothy and Thomas Findlay of E. F. Environmental. Speaker David Jahn participated in a symposium, "Waste as Resource," with an address entitled "Construction Aggregate By-Product Fines for Soil Remineralization."

The second conference November 17-20, 1993 in Washington, D.C., was entitled, *Creating Community Sustainability Across America*. Joanna and "Clancy" Eldredge of E.F. Environmental were part of a panel on Sustainable Food and Agriculture.

A third conference that ***RE*** will participate in is the first annual *Wildlands Conference* to be held in Houston, Texas during March 22-24, 1994. This is hosted by the Wildlife Habitat Enhancement Council. The conference "is about how industry, environmental groups, and regulators can work together to return lands to the wild, reduce the impact of development and better share lands with native plants and animals." As corporations become more obligated to offset their greenhouse gas emissions, remineralization of forest lands and wildlife habitats becomes a viable step towards this goal. Remineralization could be a strong basis for community/agency/industry partnerships.

From Apalachee to Dominica

Van Lewis of Tallahassee, Florida has been working with organic gardeners and farmers in the eastern Caribbean as a volunteer for several weeks each year for the last three years. On his first visit, he was strongly attracted, especially on Dominica, to the local volcanic basalt being crushed for construction pur-

poses. The fine material seemed rich.

Most of Lewis's Caribbean work has been on Antigua, Montserrat, St. Lucia and St. Vincent. He hopes to go back to Dominica again this year and work with children, gardeners and farmers there.

Dominica, and all the Windward Islands, are in crisis now because of England's entrance into the European Common Market. Dominica derives (or did) 70% of its income from banana production, and, until now, England was paying about twice the world banana price for Windward Island bananas. It can no longer do so, and this is now having a great impact on island revenue.

Lewis sent a copy of ***RE's*** article on Australian bananas and SR to a Dominican organic farmer friend, Mr. Andrew Royer, (c/o AnRoNat Farm, Giraudel, Commonwealth of Dominica, West Indies). Dominica has also had an island-wide "banana consultation" in early June (1993).

Given the article and the "consultation," Lewis fears massive banana replantations at a time when they are trying to diversify the island's agriculture, which would be much healthier than "organic monocropping." Banana monoculture is doing erosion and pollution damage to all the Windwards.

Lewis sent the ***RE*** article hoping that it will be used to help in agricultural diversification and improvement, including bananas.

Apalachee Ecological Growers (AEG) is a new organization seeking to promote contact and mutual aid between organic growers in the Apalachee bioregion (North Florida, between the Apalachicola and Suwannee Rivers), and to establish an organic farmers market in Tallahassee.

Apalachee was a fabulous organic farming region before Europeans arrived in 1539, beautifully farmed by the highly agriculturally skilled indigenous Apalachee people. They serve as AEG's inspiration. Lewis hopes to recover some of their skills, foods and agricultural techniques. Lewis says that he and his associates have begun SR work with seaweeds and rock dusts from various sources.

Hawaii's SR Crusader

The preamble to the Constitution of the State of Hawaii says: "The Life of the Land is Perpetuated in Righteousness." One Hawaii resident, Joshua Blue of Maui, has taken this important phrase to heart by creating healthful, remineralized gardens, and by increasing the awareness of other residents regarding the benefits of SR. In addition to the Earthly benefits of SR, enriching the soil, Joshua says, allowed him to cut his grocery bill to one-quarter of what it had been before he began his garden.

Before he moved to Maui, Joshua lived on Oahu, and there he had the video, *Stopping the Coming Ice Age,* played for almost 14 months on the local community access cable TV station. At that same time, he also had it shown for four months on cable TV on the Big Island of Hawaii. Currently, Joshua has the video shown weekly on Maui.

Here are some excerpts of Joshua Blue's writings that appear in various places on Maui to increase the local awareness of health and SR:

"Demineralized soils do not produce healthy plants. Mineral deficient vegetation will not nourish healthy animals. Mineral poor plants and under-nourished animals will not support healthy humans. Poor soils perpetuate poverty of the people physically, mentally, and financially. Hawaii ranks so low in national scholastic standards because our islands' (and Earth's) soils have been de-mineralized by mining of the soils by farmers, ranchers, and agribusiness. Leaching of minerals from the topsoil by thousands of years of rains and erosion also means that these soils cannot support physically and mentally healthy people."

"Well," you say, "I'll just buy supplements at the 'health' food store to get the vitamins and minerals I need." Fat chance! An excess of one mineral can inhibit the body's uptake and use of many other minerals, just as a lack of one mineral can interfere with efficient use of available minerals and vitamins. We cannot maintain good health by taking a pinch of this and a pinch of that, in pill or liquid form.

We must guarantee that the soil contains available elements from the total natural mixture and let the microorganisms pick and choose what they want, so the natural balance of nutrients comes from them to the plant life to us.

"Whadda ya mean, microorganisms?" Surprisingly, plants act as 'predators', just like animals. A plant scientist (should) know that plants can grow faster than the micro-organisms of the soil can move. Plants actually hunt, trap, and consume the cellular protoplasm from the microorganisms they capture. Soil microorganism cellular protoplasm becomes plant protoplasm. Plant protoplasm becomes animal protoplasm and both plant and animal protoplasm becomes people protoplasm.

Simply: To optimize our health, we must ensure the health of the micro-organisms in our soil, so that 'they' will have all the elements 'they' need to provide the plants which consume them and so

To be in touch with these remineralizers, see the *Network listings* section.

on, up to the top of the food chain to you and me."

Joshua makes the excellent point further in his writings that most people treat plants for diseases or pests with the chemicals that continue to deplete the soils and cause people diseases. He suggests treating the soil by addressing what it needs for its health. This will inevitably benefit plant, animal and human health.

Joshua writes in closing: "...allow yourself to take responsibility for the condition of the Earth and for helping the Earth (and ourselves) heal by remineralizing depleted soils with rock dust. Enjoy the responsibility of caring for the soil and all life. Enjoy acting to perpetuate a life of righteousness."

Queens County Farm Museum in New York

After reading ***RE,*** H.R. Templin of New Hyde Park, NY, wanted to try out rock dust and see what it can do. He got permission to do rock dust trials at the Queens County Farm Museum in Floral Park, NY. This is a 47-acre farm in eastern Queens which has been the site of continuous farming for over 200 years. The farm has been restored as a museum of the Agricultural History of New York City. It has received Landmark status and is a major location for tourism in the area. It's a working farm with bees, livestock, orchards and planting fields.

Templin plans to do a controlled application of rock dust on the planting fields section. They plant whole rows of various crops, and he would remineralize exactly half of that land so the results could be clearly seen between equal crops on both sides of the arable land. He plans to apply this in the fall when everything is tilled under. He also plans to use rock dust to repel insects on trees.

Templin writes that this landmark site has an incredible aura about it that turns even the most urbanized creature into a gentle, loving human being.

Community Gardening

Recently, Kathryn Stout of Northampton, Massachusetts made a presentation to the community garden committee on basalt rock dust using information from ***RE*** – pictures, testimonials and an actual chemical analysis from Lane's Quarry dust in Amherst.

The local garden committee did not decide to get basalt dust as a group for the entire garden – the guy in charge of finding a truck couldn't find one. But, Kathryn found someone with a pick-up truck who helped her get some basalt dust for her and his garden.

After that, several others in the (sandy-soil) community garden went and got their own basalt dust. The power of example seems to work when the large-scale organizing projects fall through.

In Kathryn's own (no control plot) experiments, basalt dust seems to help. Her garden thrives. She skipped most of the green sand she usually uses and put basalt dust where she couldn't afford to put green sand – generous heavy applications around each of her fruit trees and grape vines, and on the perennial flower garden. She is confident it's good, especially for preventing iron chlorosis in plants (and anemia in people, especially women, who eat the plants).

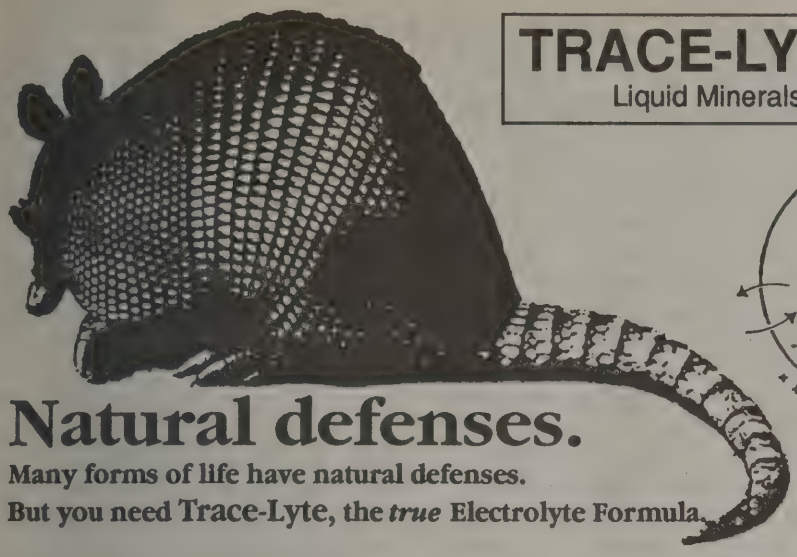
Kathryn is now working on a landscaping project – designing and planting about 1/4 acre of hillside – rocks, sand, tree roots, overlain by coarse loamy sand fill. She's considering using basalt dust there. The soil seems to have lost most of its plant-available minerals. A soil scientist at the University of Massachusetts Cooperative Extension told her that it's common, when land is switched from forest to pasture or tillage, for the fine particles in the topsoil to wash into the subsoil and form a hardpan layer. The USDA Soil Conservation survey says there may be a fragipan. She tried to dig down and look, but found mostly granite rocks and fine sand in the first two feet after a few inches of leaf mold topsoil.

Most of the plants on the site are reputed "poor soil" plants – bracken fern, hay-scented fern, grey birch, a variety of oaks, red maple, Canada mayflower, white pine – indicators of dry, sandy, acid soil. Kathryn says she doesn't want to modify anything drastically – that it's hard enough to get plants to grow which are suited to that environment – but she believes basalt could help transform coarse, loamy sand into soil for plants.

Sonoma – SR for All

Ted Dunlap's primary business since 1984 has been agricultural tractor work – mowing, cultivating, and, for the last few years, remineralizing soils around Sonoma County, California. Last year, he decided to further refine the rock powder he had been using – screening out the 1/8" plus that was part of the material and making the dust available in 50-pound bags as well as bulk.

Dunlap has seen all of the classic responses in the soil and plants he



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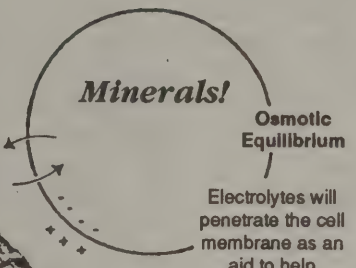

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A number of years ago Charles Northern, M.D., whose work with soils is quoted in government Senate document #264, was asked to explain his intense interest in soil minerals. Dr. Northern answered, "I'm an M.D., my work lies in the field of biochemistry and nutrition. I gave up medicine because this is a wider and more important work. Sick soils mean sick plants, sick animals, sick people. Physical, mental and moral fitness depends largely upon an ample supply and a proper proportion of the minerals in our foods."

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has remineralized with his rock powder: enhanced soil life, plant growth, pest resistance and enhanced produce quality. Although, it is still a struggle getting the rock powder market to recover the costs, he is having some success and is optimistic for the future.

Dunlap's desire is to get the volume up and drive the cost down. He wants homeowners, landowners and farmers all to be able to (and want to) afford remineralization with all of its benefits. He feels he is part of the "remineralizing revolution."

Meirbah Arabian Horse Farm Gets BIG Surprise from Rock Dust

"I have always been a student of nutrition so have designed my own (horse) feed for years. I add yeast culture for digestion and growth. Soybeans provide Lysine, Protein and Phosphorus. To balance the Calcium, usually I add Source and Azomite," wrote Gloria Davis of Wykoff, Minnesota, in the *Meridian Environmental Group Update.*

Gloria says she discovered BIO PLUS while looking for alternate sources of minerals. At the same time, she phased out Source (and/or Kelpmate) due to cost. Gloria adds flax to feed in the winter for the oil. She always adds wheat germ to the feed in winter for its oil and (increased) pH content. Her horses are extremely healthy and happy. They are full of energy, yet calm.

A few years ago, Meirbah Farm purchased a 19-year old mare, who was a rack of bones with a sore hip (limp). Gloria says it was difficult to feed the mare enough to put on weight (her previous owner almost gave up after approximately 20 pounds of feed per day). Now, three years later, this mare is fat – she races up the farm's steep hills without a sign of lameness. They have to limit her feed.

Since using BIO PLUS, Gloria says she has seen a change in the growth of the farm's foals. Their foals always grew just fine, but this last year they had a BIG surprise. A colt, offspring of a 14-hand 3" stallion and a 14-hand 2.5" mare, grew to 15-hand 2" by 15 months – with perfect legs and an incredible body.

This year, another colt is experiencing the same growth. His dam is 14-hand 2" and his sire 15-hand (out of a 14-hand 2" mare). This colt is at least 13 hands at 6 months! The farm's two fillies are keeping up close behind him.

A trainer, in the business over 30 years, has visited Meirbah Farm on several occasions. He cannot understand why their foals' legs are so much better than the usual Arabian legs. He said, "It must be the steep hills they run in." Probably so, but

Gloria believes that the proper ratio and type of minerals is just as important for proper bone growth.

If that's not enough of a surprise, here's another – the compost from the Meirbah's horse manure and BIO PLUS produced so many strawberries that their friends were utterly amazed. Where one would expect to pick 20 to 40 quarts, they were picking 120!

Rodney Barnes Sees Health Related to SR

Rodney Barnes lectures on health and gardening/agriculture in and around Hemet, California. He finds that it is difficult to talk about one without the other because our health is based upon foods produced on good soils – holding all of the necessary trace elements and minerals.

Barnes believes that without all necessary minerals and trace elements, we can not produce a complete food. As the saying goes: poor soil produces poor food and poor food produces poor people. We need all the proper elements in our food to have strong and healthy bodies capable of reproducing good T-cells which keep our immune systems healthy.

Rodney uses Rico Verde and Clod Buster to rebuild soils. He also uses his garden, tree limbs and leaves to make his compost.

All of his produce is extremely healthy, not showing the usual diseases or pest problems. He has trees that have "received the death notice" which have come back to life with the application of his Rico Verde. Rodney says he sees new growth, including buds, leaves and blossoms, on these once dying trees within two to four weeks.

He supplies Rico Verde and Clodbuster to graduate landscape architects, a few good nurseries and others.

When he shows people how to save trees by doing the sap surge they are amazed. According to Rodney, the sap surge is a process of trees to build up the immune system to ward off insects, diseases and fungi harmful to plants.

Recovery Wishes To *RE* Contributor David Yarrow

On August 6, 1992, writer and regular ***RE*** contributor David Yarrow had a catastrophic accident, which was reported in the last issue. David had massive burns, internally and externally, major skin grafting was necessary; rods were surgically put in his back to stabilize the spine which was seriously damaged.

David is still experiencing tremendous pain day to day, and only able to do minimal amounts of walking and sitting up now. He is living alone in an apartment, where he writes when he can, working on a new book, but finding it a monumental challenge.

In our last issue, we encouraged readers to write David, but he moved and could not be located at that address or phone number. He can now be contacted at: 501 S. Crouse Ave. Apt. 807, Syracuse, NY 13210. Tel. (315) 422-6906. We would sincerely love to see David receive encouragement, well wishes and assistance from ***RE*** readers.

David Yarrow's contributions as a writer-activist are great. Just to mention a few: at the Earthwise Education Center in upstate New York he was helping to resettle homeless individuals by teaching them organic farming and self sufficiency. He has written extensively on the environment, macrobiotics and Native American issues and worked to create organic certification in New York. It was through his contact with Robert Able of Gernatt Gravel, that an initiative began leading to the Task Force on Remineralization within the National Aggregate Association.

David is macrobiotic and would appreciate any high quality, organic food that our readers could send to assist his healing. He especially needs seaweeds, grains, beans and blue-green algae.

We'd like to suggest mail ordering donations of food to David Yarrow through the Gold Mine Natural Food Co. Call 1-800-647-2929 and they will be in touch with David. To send fresh organic vegetables/fruit call Diamond Organics 1-800-922-2396. Thank you.

David would also greatly appreciate any ecological/alternative magazines/publications sent to him.

Grapefruit-Size Tomatoes

Todd Franz, Bio-Essence, Inc. recently sent giant tomato plant leaves to ***RE*** from his garden in Citrus Heights, California.

He purchased the plant as a seedling from K-Mart; it showed incredible size, health and vigor fertilized with only rock dust and peat moss. At two and a half months it reached six feet in height and four feet in diameter; at 4 1/2 months it was 10-feet tall with beautiful grapefruit-size tomatoes.

Todd Franz is an active environmentalist, an associate member of the World Algae Health Network, and is currently marketing Glacial Rock Dust and Lake Klamath Blue-Green Algae worldwide.

Send Info to Ethiopia

Ato Tinsae Dubale is project coordinator of a small indigenous NGO (non-governmental organization) to a community based forestry project in southern Ethiopia.

He is very interested in SR and sustainable forestry and ag techniques. Please send him any appropriate articles, periodicals, books, and newsletters that can be read by him and his technical field staff. ***RE*** will send magazines and the research packets. ***RE*** often sends literature on SR to Peace Corp members and other activists. Your subscriptions and donations helps us do this. Check the *Network* listing for address.

Book Reviews

Super Nutrition Gardening

Dr. William S. Peavy & Warren Peary

Avery Publishing Group, Garden City Park, NY, 1993, 236 pp., $14.95.

by William Hurrle

Dr. William S. Peavy recently retired as an extension professor of horticulture at Texas A & M University. Warren Peary is Dr. Peavy's son and an investigative health journalist. *Super Nutrition Gardening* is the fruit of decades of learning and is distinguished by the breadth of its awareness and right-on organic advice. Most gardening books are aimed at niches and are written for hobby gardeners, who may or may not know/care about the whole story. This one is different.

Super Nutrition Gardening starts with dietary studies showing our deficiencies in calcium, magnesium, iron, zinc, copper, selenium, manganese and vitamins C, carotenoid A, B-6 and folacin. It details why our food is deficient – erosion, nutrient leaching, focus on gross yield, chemical salt fertilizers, pesticides, vitamin loss, and bought-off regulators -- and starts the corrective process with how to sprout seeds and use them in recipes.

Peavy advises raised bed gardens, square foot and vertical gardens, minimum tillage, soil building, composting, mulching, natural pest controls and drip irrigation. The book will definitely motivate a gardening beginner or a dabbler to get serious. It advises how much to plant of each vegetable and when, when to harvest, the nutritional value of each vegetable, how to process and store them, and the tools and costs necessary to achieve dietary health.

Peavy clearly understands that soil health is central, and that it is the microbial life which releases nutrients into the soil solution from organic matter and from minerals. The mineral and protein content of power-charged vegetables is 2-5 times higher than levels shown in standard nutrition tables such as the USDA's *Handbook 8*, republished in 1975 with data from the WWII vintage original handbook.

In the *Acknowledgements* section Peavy credits Julius Hensel's *Bread from Stones*, Sir Albert Howard's *An Agricultural Testament*, J.I. Rodale, Dr. William Albrecht and John Robbin's *Diet for a New America*. He elaborates the insights of all these giants in eminently practical, simply understood gardening instructions, except Hensel's. The book advises using seaweed to get trace elements and minerals into the plants via foliar feeding, and says nothing about providing minerals to the microbes.

I met Dr. Peavy at the Wisconsin Chapter of the Natural Food Assoc. fall meeting and asked if he'd read Hamaker. He had not. I suspect that when he does, he will do some field tests and change his recommendations for mineralization.

William Hurrle is a master gardener and master carpenter from Green Bay, Wisconsin.

Mineral Comparison (Milligrams per 100 grams of Fresh Weight)

	Potassium	Calcium	Magnesium	Iron	Zinc
Tomato					
PowerCharged	661	28.0	37.0	.91	.49
Handbook 8 (1975 data)	244	13.0	14.0	.50	—
Whitney (1985–1986 data)	207	7.3	11.4	.48	.11
Romaine Lettuce					
PowerCharged	1,117	290	72.0	1.6	.68
Handbook 8 (1975 data)	264	68	—	1.4	—
Whitney (1985–1986 data)	289	35.6	5.34	1.1	.32

Protein Comparison (Percent Protein in Dry Weight)

	Tomato	*Romaine Lettuce*
PowerCharged	17.6%	24.0%
Handbook 8	6.6%	7.8%

World Health, Carbon Dioxide & the Weather

Jesse Reklaw

Robin Rose Publishing, Santa Cruz, CA First printing, June 1993, 32 pp., $4.75 ppd.

Distributed by:
C. Olson & Co.,
P.O. Box 5100-CD1
Santa Cruz, CA 95063-5100
(408) 458-3365

by Don Weaver

Jesse Reklaw has made a study of the Hamaker Thesis as elaborated and documented in *The Survival of Civilization, Solar or Ice Age? Bulletins, The End: the imminent ice age and how we can stop it!*, the *Stopping the Coming Ice Age* video, ***Remineralize the Earth*** magazine and related materials. Now he has written a short, very clear and readable book providing a comprehensive, inspiring introduction to the subject. The author and the publisher wanted to produce a publication which could be easily read by almost anyone in a short time. In addition, they hoped it could give the reader a strong grounding in the ecological context, climate cycles, the key roles of minerals, microorganisms, soil, trees, etc., and empower the reader to know why and how to take Earth Regenerative action – and connect with others doing the same.

Jesse encourages individual responsibility for the health of oneself and the planet, reminding readers: "One person may feel unable to effect any impact on the global crisis; but there are simple, ordinary things one can do to aid the environmental cause (along with remineralization), to avert climatic disaster. Such actions are well-known, but the real importance cannot be over-stressed of: recycling, planting trees, composting, bicycling and eating vegetarian."

One part of Hamaker's total The-

continued on page 35

INDUSTRY LEADERS ADDRESS REMINERALIZATION

by Joanna Fritz

Bob Able of Gernatt Gravel Products, Inc.

The aggregates industry produces more than 2 billion tons of aggregate annually. When this aggregate is processed, approximately 5-15% of the product ends up as minus #200-mesh material (also known as fines). This means that on average, 200 million tons of minus #200-mesh materials are generated each year. Also known as dust, pond settlings, or classifier rock or tailings, the cost of handling and disposing of this material is high and there is currently little or no market for it.

The National Aggregates Association (NAA) and the National Stone Association (NSA) established committees to identify and prioritize aggregate-related problems that face the industry. Both committees identified waste fines as a primary concern.

Two committee representatives, Bob Able from Gernatt Gravel Products, Inc., and Sandra Wood from Vulcan Materials Co., recently approached the Center for Aggregates Research (CAR) about the feasibility of using fines in the remineralization process. In response, CAR recently brought together experts in the fields of waste water treatment, soil science and pathology, and human nutrition to discuss the scope and nature of the problem and to suggest several possible solutions. The experts met at CAR offices at the Texas Transportation Institute on the campus of Texas A & M University.

To understand remineralization, we must first know that demineralization is a problem caused by natural and "man-made" processes. Demineralization occurs through rainfall leaching nutrients from the soil and from wind and water erosion, which also carries nutrients away. However, nutrients are also removed through "man-made" causes such as overwatering (e.g., flood irrigation), over-farming, and over-fertilization. Remineralization is the process of placing weathered rock material, rich in minerals, back into the soil.

This is not a new idea – nature has been remineralizing the land for millennia. The movement of glaciers and the weathering of rocks are natural forms of remineralization. This process also occurs through river flooding, most recently demonstrated by the flooding in the midwest, which dumped tons of river-bottom silt on the farmland.

Typically, we treat farmland with fertilizers and pesticides to add the necessary nutrients and to ward off pests. This lasts only as long as the plants are growing. When the plants are harvested, the nutrients are harvested with them.

This new approach to adding nutrients focuses on treating the soil, and not just the plants we try to grow, with artificially weathered rocks. Top soil is no longer thought of as a holding medium for plant life but as a living tissue serving much the same purpose as human skin. A gram of soil contains millions of living organisms. These organisms process and make minerals and elements available to the plant life growing in the soil. But as the use — and abuse – of this living layer continues, those organisms are destroyed, making fertile topsoil scarce. The hope is that through remineralization, a full spectrum of minor nutrients and trace elements can be returned to the soil.

"We're not looking to dump our by-product on the agricultural market," Wood said, adding that industry is seeking answers to questions like "Can we spread this material [on agricultural land]? Will it be beneficial? How will it affect the food chain?" In other words, what merit does this process have?

"We're trying to find a home for these materials," Able said. "We feel that remineralization could of-

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Joanna Fritz is a contract writer for the Texas Transportation Institute and the Center for Aggregates Research. TTI is the largest university-based transportation research agency in the United States; CAR is an industry-funded research center operated by TTI at Texas A&M University and the Center for Transportation Research at the University of Texas.

Topsoil is no longer thought of as a holding medium for plant life but as a living tissue serving much the same purpose as human skin.

U.S.D.A. Plans Field Demonstration Sites for SR

The U.S.D.A. will be setting up a series of field demonstration sites this fall under the direction of Ron Korcak, Research Leader, Fruit Laboratory. ***RE*** will be kept up to date as the plot areas are developed.

Robert J. Able of Gernatt Gravel Products Inc. has forwarded approximately 4000 pounds of minus #200-mesh sand and gravel classifier tailings from their Springville, NY facility, the NAA/NRMCA Joint Research Laboratory in College Park, MD for incorporation into the program.

Sand and gravel fed to the Springville plant originated in the Labaradore, Canada core and was part of the Continental ice shield that covered this area during the Pleistocene Glacial Epoch. The material was exposed approximately 10,000 to 15,000 years ago as a part of the Wisconsin glacier in an outwash plain.

fer a potential but we have a lot to learn."

Many different rock types could be used for remineralization including lava rock, glacial gravel fines, granite dust, river gravel sediments, and diabase dust. However, testing is required to not only evaluate performance and cost, but also to evaluate bio-toxicities.

There are many unknowns, but some questions were answered during the meeting. For example, other potential markets were identified including agriculture, forestry, water and water systems, composting, and retail sales such as home lawn and garden, national chains, home compost starter kits, etc. Some questions remain to be answered. For example, at what levels, if any, does this process reach the point of diminishing returns? How will the minerals and trace elements in the fines become available (water soluble) to the plant life? What are the drawbacks in using this process?

The meeting was informative, productive, and w as the first step toward finding a solution. The participants a-greed that they will continue this discussion in the near future.

For more information about this project, contact Dr. Dallas Little, Center for Aggregates Research, (409) 845-8212.

Sandra Wood of Vulcan Minerals Co. discusses remineralization during a recent visit to CAR.

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River's Turn Farm: An Interview with Organic Grower John Sundquist

by Carol Cina

Today, John Sundquist grows seeds, vegetables, fruits and nuts organically on 33 acres of alluvially-deposited river bottom loam soil, 20 acres of which are under raised-bed cultivation. For fertilization, he mixes commercial trace minerals (Azomite, Elamite, or TMI 188), kelp, rock phosphate, bat guano, and sometimes Sul-Po-Mag right into the seeds and plants them together. Five years ago, he started also putting crushed gravel on his seed and vegetable beds, a little bit each year on different areas. He says the rock dust has made a tremendous difference in plant vigor, cold hardiness and resistance to insect damage. "It's hard for anybody to believe that rock makes a difference," John observed. "It just doesn't make sense. One local guy, just a neighbor, wondered if I was going to put that gravel on my potato beds. I said I was going to put it on that and some other stuff, and he'd said, "Yeah, we used to use that in potato beds. It always made good potatoes." But his neighbor doesn't do it any more.

What was first noticeable, right in the first crop after rock dust application, was less insect damage, especially in typically ravaged crops like fall-planted Chinese cabbage or turnip greens that more often than not get turned into lace by flea beetles.

What is "higher use" of his land? Education of children is John Sundquist's answer. A kindergardener (child gardener!) feels a garlic plant while rodent control patrols up the row.

"After a couple of years now, you actually have to go around looking to find the ones that were damaged", John says. "The leaves are still very, very healthy a couple of years after one rock dust application. We've had a few years when we couldn't find one corn earworm, and the neighbors are raising commercial corn all around us. This is true for the above-ground insects like flea beetles and cucumber beetles and for the below-ground insects like carrot root maggot as well."

John recounted the experience of friends Sally Brewer and John Eveland at Gathering Together Farm in Philomath, Oregon, who applied rock dust to a field of red kale and found they got a lot better frost protection during the hard winter three years ago when temperatures went down to three or four degrees. Their

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This is an excerpt of an article reprinted with permission from In Good Tilth *April 1993.*

Last year's greens mix of mizuna, daikon, roquette (arugula), bok choy, and lettuce still growing vigorously in their rock-dusted raised beds in January of this year.

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red kale came through strongly, almost exclusively in the field where they'd put the ground rock. That's been his experience at River's Turn Farm too; rock dust gives a lot better protection from frost damage.

"We put it on at five to seven tons per acre, John continued. "We've had broom corn that was ten feet tall this year and vigorous as can be. When we planted the broom corn we mixed in a little bit of trace minerals and kelp, but it didn't get any compost or chicken manure. It didn't get any other measurable nitrogen source. Even broccoli and other crops – the only vaguely measurable thing that's dissipated over acres is the starter fertilizer that we mix right along with the seeds, and of course that can't be too hot, otherwise it would burn them."

John buys crushed gravel by the truckload from his local sand and gravel establishment. It's called 1/8 minus or slurry grade or #1 at his local, but different places call the fine stuff by different names. He reasons that he can get a thousand pounds of commercial construction gravel for the same price you'd pay for an eleven-pound bag of specially selected, dried and sifted agricultural rock dust, and maybe 500 pounds of it would probably be the mesh you want.

"It seems to me that particle size is even valuable itself," he continued. "In a lot of clay soils you have a drainage problem from not enough large particle size occurring. A lot of Western Oregon soils are that way. They are all a homogeneous bunch of red clay. The red clay is the high iron, high aluminium fine. In the origins of soil, that would only have been produced under tropical rainforest conditions."

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Mineral Rites Transform Couple's Garden Plot

by Auslan Cramb

Magic dust: the minerals in ground-up stones rejuvenate the micro-organisms in the soil and they in turn provide increased plant nutrients and improved growth of plants.

Grinding up rocks and ploughing them into the soil sounds a bit daft – until you see the giant cabbages and cauliflowers which grow there with abandon.

Marigold, Silas, Hazel, Willow and Holly were born within seven years of each other. Their mother, Moira, is proud of the fact that the births were no problem. Eating rocks is her health secret.

Cameron and Moira Thomson and their five children live in a rented cottage with a quarter of an acre of ground on a farm outside Dundee. They call it the Earth Regeneration Centre, and it may be the only garden in Scotland dedicated to soil remineralisation.

The results achieved by putting 20 tonnes of rock dust into the ground are startling and persuasive: gooseberries as big as plums; blackcurrants as big as grapes; radishes the size of a fist; giant cabbages and cauliflowers.

The house is at 600 feet, no manure is used, no chemicals are used and the plants are never watered. Cameron does not own a watering can. The flavour of the produce, they insist, far exceeds that of chemically farmed vegetables.

Every day the lush, chaotic plot produces one meal and one salad for the family of seven. All of them eat the mineral dust to improve their health – just a teaspoonful a day. Friends once brought them two rocks from Jerusalem and Bethlehem. Moira and Cameron ground them up and ate them. Hallelujah.

There are recognisable beds where vegetables have been planted, or sown, but much of the ground is left to its own creations.

Self-sown brussels sprouts, cabbages and parsnips rub foliage with peach seedlings, rowan trees, young oak. It is a lazy man's garden; after the hand graft of ploughing and digging in the rock dust, it is no longer necessary (at least for several years) to dig the soil, or to fertilise it, Cameron says.

Cameron and Moira are unemployed pioneers for remineralisation in Scotland. Their dream is to set up a commercial garden on a much larger scale.

They envisage a co-operative, providing jobs for the unemployed, in which people will pay £1 in return for regular deliveries of fresh produce. Convincing potential benefactors is the hard part.

In just over a year, however, they have had around 400 visitors to the garden, against the wishes of the local farmer. A considerable number have taken to remineralisation and report dramatic improvements in their plants.

The science/art is well-established in Austria and in the United States, and, if it sounds unconventional, it should not. The benefit of restoring lost minerals is well founded in soil science, and in human health. Minerals are lost from the land through erosion and run-off.

Much of Scotland has been impoverished by the constant demands placed on soils and the failure to restore minerals to them. Remin-eralisation could produce dramatic results in many areas of the Highlands and islands.

It also has important implications for the quarrying industry, which produces silt and rock dust in vast

Every day the lush, chaotic plot produces one meal and one salad for the family of seven.

Permission to reprint this article from The Scotsman, *October 2, 1993.*

High hopes: Cameron Thomson, chest-high amid his cabbages, does a minimum of garden maintenance after having treated it with 20 tonnes of rock dust.

Remarkably, a stone with surface area of one square foot will grind into rock flour or dust with a surface area of eight acres.

quantities, and then dumps it. The "miracle" treatment for Scottish soil is available at dozens of gravel and aggregate quarries.

How does it work? The many minerals and elements in rock dust (volcanic rocks are particularly useful) rejuvenate the tiny micro-organisms in the soil and increase their growth. These provide increased plant nutrients and improve plant growth and vitality.

The Thomsons' work began properly in 1984 after Cameron, formerly an art teacher in Dundee, read a book by an American, John D. Hamaker, which calls for no less than the remineralisation of the planet.

The best treatment is glacial dust, which is created by large glaciers crushing rocks beneath them. Remarkably, a stone with surface area of one square foot will grind into rock flour or dust with a surface area of eight acres.

Cameron had a total of 20 tonnes of dust, from different quarries, ploughed into his small garden. He also added "green manure" – agricultural radish and vetch – to supply the necessary organic material. He then spent a year digging by hand. Now, he may do no more than scatter seed by hand, with occasional light hoeing of the ground.

The couple are severely limited by the size of the garden and the scale of their income. They believe, nevertheless, that their lifestyle has global implications.

Undaunted by life on a small garden, and the ridicule of critics, Cameron quotes Edmund Burke: "Nobody made a greater mistake than he who did nothing, because he could only do a little."

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UPDATE

From *Twahamwe* newsletter

News of Men of The Trees in Western Australia

Checking soil pH before the field trials are Malcolm Borgward (farmer), Mike Baker and Mike Bolland (W.A. Dept. of Agriculture) and Dr. Philippe Hinsinger (University of W.A.)

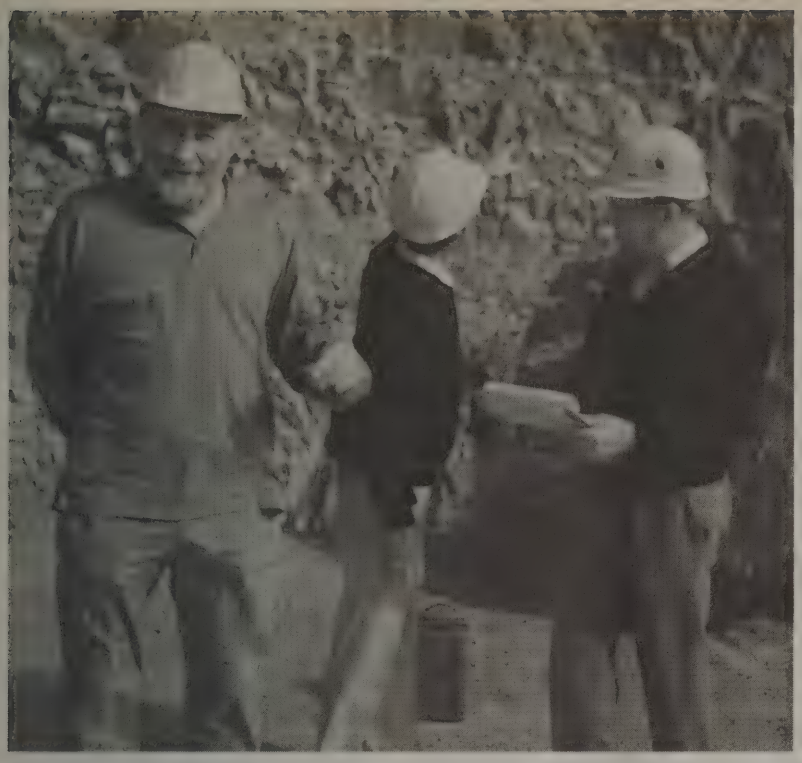
Universities Back Dowerin Venture

"The most comfortable and convenient field station we've ever had" was Professor Jonathan Majer's comment after returning from a week at Amery Acres with a group of 16 Curtin University students. He had just visited Men of The Trees trial farm at Dowerin. Established in June, 1992 the farm is set to explore a range of trees and agroforestry systems and to test the theories of rock dust as a way of improving wheatbelt soils. The Curtin students had made detailed surveys of the farm's invertebrates, the health of trees on the adjoining arboretum and soil quality of the initial rock dust trials. All this will be invaluable information as Amery Acres develops.

Trial Plots

Professor Bob Gikes of the University of Western Australia has also volunteered valuable support. Under the direct supervision of Dr. Philippe Hinsinger of the Institut National de la Recherche Agronomique, Montpelier, France, a series of trial plots have been set up comparing the performance of granite rock dust with conventional NPK fertilisers.

Co-ordinating the Tree Farm Project, Barrie Oldfield said he was delighted with the scientific input and Men of The Trees would give all the support necessary. "There is evidence from around the world that rock dust revitalises soil and helps produce healthy plants," he said. "With help from Pioneer Quarries, Dowerin Shire Council, local farmers, plus quality research by our best scientists, Amery Acres is all set to make a significant contribution to the State's landcare efforts, in a largely unexplored area."



David Bellamy preparing to fire the charge. Behind him Barrie Oldfield and Harry Smith discuss camera angles.

Bellamy's Big Bang Theory

"I've always wanted to have a go with one of these!" said David Bellamy rubbing his hands with glee. The next moment 23,000 tonnes of granite rock was blasted out of Pioneer's Herne Hill quarry as TV's favourite botanist fired the charge. In his latest video production for Men of The Trees, Bellamy explains why rock dust works to rejuvenate our soils.

Full of support for work done by the Society in proving the value of using dust in raising strong nursery seedlings he now pleas for financial support to make the farm venture at Dowerin a winner.

Remineralisation

The process of adding finely ground igneous rock dust to the soil has been known for a hundred years. At the end of the last century, Julius Hensel, a German chemist, showed that the fertility of soils could be improved when rock dust is incorporated with humus. The technique is referred to as 'remineralisation'. It was tried on 2,000 tree seedlings at St Barbe Grove Nursery in 1991 with amazing results. Seedlings attained their planting out size in as little as 7 weeks compared with 5 months under normal expectations.

As a result rock dust, granite dust from Pioneer Quarries at Herne Hill, is now blended as a standard practice in the potting mix used at the Nursery and also in the bagged mix supplied to growers under the Farm Tree Help Scheme. It is part of the Men of The Trees desire to improve by every means possible the health and survival rate of trees planted out under the most adverse conditions.

Worms Join Soil Quest

The compost eating worm *Lumbricus rubellus*, better known as the "Red Wriggler," is helping Men of The Trees in their quest towards improving the soils of Australia.

Initial trials have shown that the worms actually prefer a feed ration to which rock dust has been added. "We are trying to grow the very best trees to save the wheatbelt," said Barrie Oldfield, Co-ordinator of the Tree Farm Project. "The better the soil the better the trees. And a soil where everything is in balance, the minerals and the organic matter, is the soil of a good farm."

Initial trials have shown that worms actually prefer a feed ration to which rock dust has been added.

A newsletter is posted to anyone interested in these trials.

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An Interview with Sam Catalano

by Joanna Campe

Australian Sam Catalano of Pacific Minerals Development, Ltd., distributor of Min Plus rock dust, made a trip to the U.S. this spring visiting with Walt Zmed of EarthWealth, Rick Meininger of the National Aggregate Association, Ron Korcak of the U.S. Department of Agriculture and Dr. Herster Barres of Macadamia USA/Costa Rica. The following interview took place in May in Northampton, Massachusetts.

Joanna Campe: How did you discover remineralization?

Sam Catalano: When I first started farming in the early fifties, one of the first things we noticed was that wherever there were rocks, produce was always better and more resistant to insects and pests. We always curse rocks as a nuisance because they're an impediment in farming.

We farmed right through, and in 1982 when we started quarrying for road materials, instead of cursing stones we were looking for them. The cattle would sit on the ridge and wait for us to hose the quarry plant down for the afternoon.

Remineralization hadn't entered my mind at that stage. But the cattle would walk through the clear waters of the creek and come to drink the wash waters. I thought coming to drink dirty water seemed crazy, but I always knew there was something that they wanted.

I then made approaches to the Department of Primary Industries, CSRIO, and they all said "You're mad! You're dreaming things!"

Then in 1984, Dr. Gavin Gilman came to Australia from Hawaii. He was at the soils lab in Townsville and had done some preliminary work with remineralization in Hawaii. I did about four years of research with Gavin, on and off, not totally devoted to that.

In order to get fine dust for the trials, we had to rake up what we could from tail drums on belts and underneath the return rollers. At one site we couldn't get enough, so we got some scoria, which is just about the same thing. We put it out on a concrete floor and ran over it with a roller to get some fines. Those are the sort of extremes we had to go to get fines for doing research.

After four years, Gavin had no more research funding from the government and took a job with the World Bank in West Africa. When Gavin left we had to see who else we could get to do the work.

We then took our research to Queensland University with Dr. Ross Gutterdige and Chris Searle and they conducted 600 glass house pot trials. In the trials, we learned a couple of things: one, we needed more material for further trialing, and two, that we could increase root growth by about 8% and that there were some responses in the potash and phosphate emission trials. Rock dust was applied with some of the potash and some of the phosphates.

We needed to work further, so we set about building a pilot plant to produce a more consistent material. We then instigated some more trials with Queensland University and Dr. Gutterdige.

The plot trials that are going on at the moment are in two specific locations: One is a very degraded soil made of decomposed granite at Mt. Catton, and the other is in the very rich red basaltic soils of Redlands Bay. In the rich red soils we didn't get much response. In the degraded soil we're getting some very good responses, which indicates that the product is very useful in areas which have been heavily farmed, and especially for soils that people are on the verge of walking off of.

It's a 5-year research program which has been going on 18 months, and we receive half-yearly reports of the results. We plant a winter crop and a summer crop. In winter we grow oats and peas and in summer we grow corn and soybeans.

In the pilot plant, the material can't escape as it's all ground, so the minerals are evenly distributed throughout the product. This is very important in any research that's done. Material that is taken from a pond is not going to produce the same consistent results as freshly ground rock. That was the problem we had.

Bare soils store carbon with SR

We did one test in which we kept the paddock bare of vegetation. Six months after we had applied the product, we retested the soil and found that in strips where rock dust had been added there was an increase in organic carbon: we had an increase of 20% in six months and we had no answer for it. If we had let the vegetation grow on the paddock I would understand that that would increase the vegetation growth and the amount of carbon. We didn't do this; we kept it bare. We've got a theory, and we need more research, but we can't afford to do that at this time.

Rock dust increases microbial activity, and we know that's a fact.

Now by increasing microbial activity, microbes eat and excrete the fine particles of soil, creating bigger clumps, and by doing that it allows better water penetration, allows the soil to breathe better and the air to go down through the soil. The soil had been taking in high levels of carbon monoxide and converting it into organic carbon and then excreting clean air.

This would certainly be beneficial for CO_2 research. The amount of CO_2 in the atmosphere would be lowered. Most soils are very low in carbon, so if you could harness that, we could go a long way in slowing the Greenhouse Effect.

Silica

Silica is a fiber builder. We've observed that anywhere we've applied rock dust the fiber of the plant is a lot stronger. When you try to cut it, the outside skin is a lot harder and it has a tendency to repel a lot more insects because they prefer things that are easier to chew. The leaves are a much deeper green.

After one plantation, part of which was remineralized on a Friday afternoon, they got a few inches of rain. By Monday, you could see a marked difference in greenness; the difference actually showed up in the photograph.

JC: What is the impact of SR on bananas?

Sam: Bananas have roots on the surface and they fall over very easily due to wind. The problem has been blamed on nematodes. The work we've done indicates that the nematode gets blamed for a lot of things it hasn't done.

Our work has indicated two things: one is a pH problem, and in Australia the limes that we've used are fairly coarse. It tends to change the pH only in the top two inches of soil; the lime doesn't move down into the soil profile. What tends to happen when you have a good pH on top of the soil and down lower the pH is very low, is that the plant tends to send all the roots into the soil with the better pH and the wind knocks the stool over because the roots are so shallow. Because there are no roots on the bottom of the banana carm for some reason the chemical companies tend to think it's a nematode problem. From the work we've done, it's a pH problem.

Second, muriate of potash is 50% potash and 50% chloride, and a lot of problem with no roots on the carm is chloride burn on the roots, so it's a mixture of the two; of chloride burn and low pH. On the bottom you've got aluminium toxicity because of the pH. I don't believe the nematode is the problem. If there's a nematode there it's just telling you there's a problem and you've got to fix it.

What difference does SR make to these particular problems? The rock dust we use is very fine and it penetrates down into the soil.

Another difference between rock dust and lime is that rock dust has a much higher ion exchange capacity than lime, so it has better capacity to change the soil pH. Rock dust is magnetic and it helps the soil hold nutrients longer, and you need to apply less of the chemical-based fertilizers.

So you're getting less chloride in the soil and less chloride burn. I personally suggest to people growing bananas that they consider not using muriate of potash, but to use white sulphate potash instead which is far better for the root system, although it's more expensive.

When you apply rock dust you get a root system that's deeper and you get the root system right around the carm.

JC: You sent some photographs of a remineralized banana plantation after a cyclone had hit and it seemed that the trees were much sturdier...

Sam: We found that where we didn't have the rock dust we lost 60% of the stools to uproot. They were falling on the ground. Where we put the rock dust we still lost the trees; but instead of falling over, they broke off. We were able to go through and clean the remineralized stools up and they started producing bananas again, whereas it took months for the others to get back into production as they had to be replanted.

Scab moth in bananas

Scab moth affects the banana skin. It doesn't affect the inside of the banana, but from a marketing standpoint it marks the outside skin, and the market tends not to want that type of fruit. The work we did with that was that when the scab moth larvae formed we controlled it with rock dust.

What they currently use for scab moth larvae in bananas is talcum powder mixed with the pesticide losban and it's pretty deadly. They use the talcum powder as a carrier.

We tried using rock dust on its own, and we were still getting pretty good control of the scab moth larvae, so we had discussions with Dr. Zaleski at the University Dept. of Entomology, who ran some pretty good tests on it. We sifted the rock dust out to minus 100 microns, mixed it with the pesticide losban and dusted it. Then we did two short rows with rock dust on their own and we got pretty good control.

Dr. Zaleski agreed to do some trials for us, so we gathered some banana bells that had scab moth larvae in them. Unfortunately, when we sent them down there was

an airline strike and they sat at the airport for a couple of days, and it was a weekend. So he got them five days after we'd sent them down. By then the larvae had gotten quite large, and we found that the dusting didn't kill them. But we found if we put a fair amount of dust we could kill them, but that wasn't the point. We had to simulate dusting with a commercial hand duster.

When we did this, two things happened: First, it wore off their antennae and all their hairs so they couldn't transmit or receive messages any more, hence they didn't know when to mate or where another tree was. The second thing that happened was that as they moved around the material went into the crevices of their backs. That's probably not an entomological term; it lodged between the segments, and you can see it on these photos where it's magnified 7000 times.

If I have a rock in my shoe I can stop and empty it and keep walking, but the poor old scab larvae couldn't do this, and so they couldn't move about any more. The dust didn't kill them, but it stopped mating and doing any further damage.

We need to do more research on this. The research scientists at Queensland University said that basically we've opened up four decades of research. Of course if we got heaps of funding they could do it much more quickly.

JC: Tell us about MinPlus.

Sam: We have two finenesses of rock dust. We have our standard product, which is 90% passing 150 microns and that's the one used mainly commercially. We have a finer product which is 90% passing 40 microns, and that one is used as a foliar spray. And we use that in the retail market packed by the bag for home gardens.

We recommend applying our product with conventional lime spreaders. If we're using spinners we add 5% moisture, otherwise it would go into the atmosphere.

We use masks for protection. It is important to use a mask, one of those disposable masks that fits over your nose and mouth.

For the foliar spray, we just use conventional spraying equipment, mixing the dust with water.

In Queensland Minplus has been used on bananas, and its benefits for bananas are quite dramatic because the material is paramagnetic, and the bananas are irrigated and getting water every week. Other nutrients tend to leach out a lot quicker, so because it's paramagnetic it holds the nutrients a lot longer.

JC: Some of our readers are interested in the paramagnetic qualities of rock dust...

Sam: Basically the soils have lost their ability to hang onto nutrients. Because the material is magnetic it increases the cation exchange capacity. This has two major benefits: One, the person using it can cut down on his/her fertilizer bill, and two, as far as the environment is concerned it eliminates a lot of the fertilizer leaching out into the waterways and the ocean. The work we've done indicates that it's magnetic and gives the soil the ability to hang onto nutrients.

JC: What other crops use MinPlus?

Sam: Minplus has also been used in the small crops, cabbages, tomatoes, lettuce, that sort of thing, usually with very good results.

In our video one tomato farmer appears who was having success over the years but had depleted the soil's mineral nutrients. His crops were declining. It had declined to the stage of giving tomatoes away and he was thinking of raising something else until he used the rock dust. Now he has built the fertility back into his soil and produces good tomatoes. He's been using rock dust for two years now.

In the case of the above tomato farmer, he applies it on the ground before he plants and then he foliar sprays them lightly every week. And one farmer gets three crops a year of cabbages and lettuce, and works the rock dust into the soil before he plants each crop.

On sugar cane we've had pretty good results. We've increased production about 20%. We're doing some work at the moment on stool tipping in sugar cane. The stool is where the plant stalk meets the ground. You have eight or ten stalks coming out of one stump, and that's the stool. With bananas, they throw suckers from the side. In sugar cane, whatever comes up you leave.

There are some cultivars that require more calcium than others. Others can tolerate less aluminium toxicity. Generally, the better producing varieties of cultivars are the ones that can handle the aluminium and require more calcium. What has happened in Australia and in other parts of the world is that instead of going to the core of the problem they want to address the symptom. The symptom is stool tipping. All they do is breed another strain and another variety that doesn't require as much calcium and is more tolerant of aluminium. So we've still got the calcium deficiency and the aluminium toxicity.

We've had very good results with pawpaws. Rock dust is also being used in the cut flower and orchid industries.

JC: You have a coming court case and problems around permission to run the pilot plant...

Sam: When we first started with this, I approached the local government and requested to build a pilot plant for doing research on SR. I asked what permits they wanted me to get. What did I need to apply for?

I approached the top level officer in the planning section of the local authority, and he said to me, "Look, go ahead and build it." At this stage nobody knew anything about us, and we continued with our research.

We did this, and possibly fifteen months later we produced material and went into the market place and tried to generate a market for this material and were telling people of the results we had with Queensland University and the theory that Ross Gutterdige had come up with after the pot trials.

The research scientists at Queensland University said that basically we've opened up four decades of research. Of course if we got heaps of funding they could do it much more quickly.

SR versus fertilizers

If you applied 500 kg per hectare you could lower your input in NPK by one third. As farmers started using more rock dust than 500 Kg per hectare and were using as much as two tons per acre, they found they could reduce their NPK use by more than 50%. Some started to cut it back about 90%. Once the fertilizer companies got wind of this they were not too happy at all. The next thing we know, we have the local government knocking at our door saying, "you've got to make this project legal now" and knowing full well that they had given us approval to do it and that we didn't have to do anything else.

They sent two of their planners up to look at what we were doing. Three weeks later, they came up with recommendations, and the recommendation at that stage was that we could apply for "consent use," which we did. About a month after that the local authority decided, no, that's not the way we should do it. And they wanted us to apply for full re-zone. They told us then that they didn't want the project, and even if we applied for a full rezone they wouldn't approve it. They wrote to us and offered us dollars – a monetary offer to withdraw our application for consent use. We said, "No, we won't withdraw it." We still have the letter.

We wouldn't withdraw it. It went to the local Shire Council. We had to advertise it for thirty days, and it brought eight objectors. Two of them were close neighbors and six about two kilometers away, and there's absolutely no noise and no dust near them. Consequently, we got noise levels and dust levels taken. At the time we were complying with the noise abatement act and the clean air act. The production side was more than complying, but the discharge side wasn't.

We were in the process of enclosing the loading bay when the Shire served us notice to stop building because we hadn't applied for a permit. Since then we've had a computer model made of the operation. The findings of the computer model were that if we enclosed the loading bay we won't have a dust problem. When the case got knocked back we had to work out what we were doing. They said we were going to have to go for a rezone.

In order to open a pilot plant, local government required that we do an environmental impact study. We were given a list of things that they wanted addressed, and these things were: dust, traffic and electricity.

Traffic issues had been addressed.

We then went to the local electricity authority and asked if there were any problems with the electricity, and they had to set up all sorts of meters for what we are doing.

It has cost a lot of money! I wonder what the hell we do it for, but anyway, these are some things that we had to do. We got all this done.

The next thing we had to do was to get noise and dust experts in to monitor the noise and dust levels. The plant can operate within the boundaries between 6 a.m. and 10 p.m. If we want to operate the plant around the clock we need to put a concrete wall around the compressor.

Insofar as the loading bay was concerned, the Department of Environmental Heritage required sheeting of the shed. We weren't happy with that because that would have given the local authority an out. What we were cautious of was the fact that with the sheeting of the shed we didn't want them to come back to us and say "we don't know if this is going to fix it or not."

So we called in another dust expert who set up a computer model of the operation. The findings of the computer model were that if the shed were enclosed, we wouldn't have the problem. Now we were confident that this would happen. We would have done this ages ago if we'd been allowed to do it. All the material for it is sitting in the yard since October 1992.

I believe that the problems have stemmed from the time when people started saying to the NPK people, "we can do better than that; using MinPlus, we can replace 50% of the NPK that was used". I let people draw their own conclusions as to why I'm having problems.

It's now going before the Council, and the Council has to make a decision before the end of June. We'll probably be in court the last week of July. (See p.34 for Court Update)

Trip To Washington

The National Aggregate Association wasn't familiar with the research I had done in Australia. All the research in Australia has been funded solely by ourselves, so that research is ours, and no University can release the findings. We've done close to half a million dollars in research.

Members of the NAA have hundreds of tons of minerals stockpiled and they hope to be able to use that material in remineralization. Well, one of the problems is, the less consistent the material, the more you've got to apply. Then you've got the cost of transporting it.

In the beginning you'd have a different mix of materials released than you would at the end. Certain minerals would get released sooner, though it is not *actually* unbalancing for the soil. If it is coarse, as long as you can afford to put the volume on it's no problem. If you could put it on and amortize it over twenty years... the problem is that farm-

Deeper root systems of bananas trees with Min Plus.

ers don't have a lot of money and they can't afford to put money up front. I don't know what the return for farmers is like here, but in Australia farmers can't afford to put a lot of money up front for SR.

The meeting with Dr. Herster Barres in Mystic, Connecticut, was very interesting. If something happens in Costa Rica we'd certainly love to be part of it. He's trialing macadamia trees at the moment. We've applied rock dust on macadamias since 1992 and we won't see anything until the harvest of 1994. Dr Barres and I will be able to compare the ongoing tests.

Walt Zmed of EarthWealth in southern California showed us their quarry plant which is very large. Their material is different from that we've been used to. Walt was telling me that their deposit has probably come down in four or five glacial flows, so he may have a greater mixture of rock types. I would like to see them do a sixty-element scan.

In Australia there is concern about chemical fertilizers. There have been a lot of land care groups established and, unfortunately, one of the biggest contributors to their research is the fertilizer industry. So the land care groups have as their master the very people that they're trying to bring something against. Research done at the universities is basically funded by the chemical fertilizer companies.

I'm a very determined person, and when I set a goal I do everything to try to achieve it. I set my goal in doing this SR work and it's going to take a lot to convince me to stop.

A lot of people in Australia have tried it before, but they've gotten nowhere near as far as I have. They've said to hell with it! and stopped. Sometimes I get to that stage; why the hell should *I* do it? And on the other hand I look back and say, "Well, do we want to leave our country to our children and grandchildren or do we want to hand them a desert?" I'd like to leave my grandchildren a decent country to live in, and that's why I do it. Not only them, but all the people involved.

That's the force that's pushing me onward. Could make a lot more money doing other things, and have a lot fewer headaches, but I guess I'm an animal that likes a challenge.

To me, anything that grows in a soil bed, whether it's a lawn, a flower bed or a commercial farm, fruit farm or whatever, SR can be used. It's as simple as that. There's a very broad usage for the material that could take up hundreds of thousands of tons a year.

SR in Africa and the Philippines

Gavin Gilman is in Africa doing some work now. He's been there for a couple of years. He is working in Africa on a project funded by the World Bank. He talks about Agrogeology in Canada. In West Africa the problem is less one of dollars than of finding the material. If West Africa has a problem getting material for their research, I think we should get together. We could build a pilot plant to produce material. We could probably become a part of that project in West Africa.

We've sent our next lot of material to the Philippines – the University itself is funding it – all they wanted was that we supply the material. They're paying the transport. Two weeks after I get back to Australia I'm going to the Philippines to help them lay the first trials down.

This is one place where we'll get research done that we haven't funded. The inquiry came through *Austrade* magazine. Some people there had seen the film, *Stopping the Coming Ice Age*, by Larry Ephron. (See *Resource* section) They put an ad in *Austrade* magazine. It was picked up by the Department of Development in Cairns and passed on to me.

I sent them a copy of the video that we had, plus some other literature. They made an application to the Philippine government for funding and got nowhere with that. They took it upon themselves to talk with people at the university, and they said if we would supply the material they would foot the bill for transport and research.

This is all part of the Pacific rim and that's why we call our company Pacific Minerals, Ltd. The Philippines has a very large banana industry, and that's one of the markets we were interested in. They export half a million tons of bananas to Japan alone. That's a lot of bananas in anybody's language.

They use chemicals in Australia for bananas, but even much more so in the Philippines. It's a major problem. It's not just the chemicals in the produce, but what has leached into the waterways.

Conference needed

We need to band all together as a world organization so that we're not trying to re-invent the wheel – so there aren't twenty people throughout the world doing the same research, especially as there is so little funding to do it. We need to get the most out of the funding we've got. What we need to do first is find whatever research has been done throughout the world, and say: "This and this needs to be done, and what can you and you commit?" We've looked at the broad picture first. We focus on what we want to pursue at this stage and decide what to fund.

The petrochemical industry is very strong; they basically control governments so that governments are reluctant to do anything. I know from the researchers that I talk to, a lot of them are very reluctant to commit anything to paper. You talk to them one-to-one, no problem. Great thing. You try to get those people to put something down in writing – that's another thing.

Economic realities of farming

As for the people using rock dust, I don't know what farmers in the U.S. are like, but in Australia each and every one has an overdraft. If we go to the bank manager and say, "We're going to spend thirty thousand dollars on this new, wonderful product." They say, "You don't know whether this is going to work or not. You will continue with the traditional fertilizer." There's pressure on farmers not to use it. Change is uncomfortable. You're used to wearing a watch on your left hand. Put it on your right hand and it feels uncomfortable. That's a change. Just imagine trying to change from the conventional fertilizers you've been using to something new, and there lies the problem.

If you had the Department of Agriculture and the Extension officers recommending it, there would be no problem. It would spread very quickly. They've all been trained in universities which have been funded by the petrochemical industry, and that's all they know.

Research done at the universities is basically funded by the chemical fertilizer industry.

Sam Catalano visiting Dr. Herster Barres in Mystic, Connecticut.

There are more geologists saying you should be using this than Extension officers or agriculture people who are really the ones that farmers take note of. If the Dept. of Agriculture will take notice, then the bank manager will take notice. But if the Dept. of Agriculture says "I don't think it's a very good product", the bank manager won't let you use it. Unless you've got no overdraft and money of your own, no problem. But other than that they won't let you use it. That's it in a nutshell. I get all kinds of cynical things...that I'm round the bend....

JC: I've heard that before!

Philippines Update

Sam went to the Philippines in June, and put four trials of rock dust down on the Gregario Araneta University Foundation Farm. He'll be going back to the Philippines in November and will report on his findings in the next issue of ***RE***.

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Court Case Update

by Sam Catalano

My case went to trial on July 27 and 28. The week prior to the case, we obtained a court order to allow us to operate the plant for a court inspection on the morning of July 27.

The inspection party was comprised of the judge, his clerk, a court reporter, two legal representatives from the local government, two legal representatives from our side, and myself. The inspection party inspected the plant in operation and inspected the closest residences that had objections with the plant running.

In the afternoon in Innisfail, the court took evidence from the local people including people living in the houses that had been inspected in the morning. The case was then adjourned to Cairns for the following day.

In Cairns, Dr. Andrew Wood gave evidence to confirm the research nature of the plant and product, followed by myself and the town planners for both sides.

The judge who allowed the appeal gave the local government representatives directions on how to frame the conditions. The local government decided to totally disregard the directions and framed conditions totally contrary to the judgement and the act.

These two offending conditions were regarding the name and the time frame. They were very restrictive as to what we would be allowed to do, and the time frame was five years with power of attorney to rezone back, which was contrary to the judgement and also contrary to law.

So that put us back into court again in Brisbane on September 28 where our appeal was again upheld by the courts. We now have some formalities of paper work to do before the application goes before the local government for signing before I can operate the plant again.

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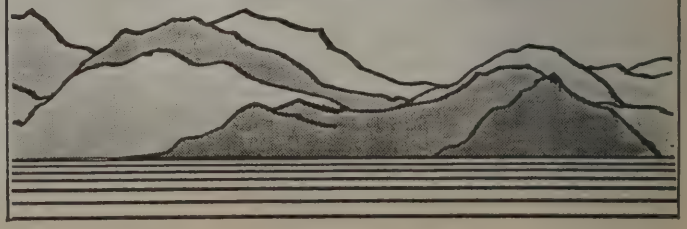

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sis is his call for fundamental economic change (detailed in Ch. 7, *The Survival of Civilization*), and like many who review Hamaker's messages, Jesse Reklaw generally avoids them. Hamaker continues to insist that they can't be avoided because major economic change and "justice" must accompany and promote the huge ecological changes needed to help the Earth heal and regenerate, and for the climate to stabilize into interglacial balance. Of course, this is a very concise book.

Before a good bibliography Jesse includes a Databank section to list the more in-depth sources. On political and economic changes, he does say:

"Politically, as well as individually, there is much to be done; mounting protests, organizing local environmental groups, joining networks, educating one another. Some progress towards regenerating human and planetary health has been initiated by politicians, organizations and demonstrators worldwide, though this is only one step in the right direction. Destructive business interests must be stopped, by legislation or boycott. In the capitalist economy, the dollar is a vote. Americans should be aware of what they support by purchasing fast food burgers, TV dinners, canned soup and similar products."

The list of rock dust sources is much shorter than what is found in ***Remineralize the Earth***, and one of them, Rado Rock, is unfortunately, no longer in business.

The book has a cover price of $3.25, ($4.75 ppd.) with 6 copies to one address costing $11.70 in the U.S. and Canada. Write or call the publisher for larger quantity discounts. He'll work with you to get this book out to as many people as possible. I know he is serious about world health and carbon dioxide because, along with many other conscious actions, he sold his car and now usually walks or bicycles.

The Centenarians of the Andes

David Davies

Anchor Press/Doubleday, 1975.
Out of print, check your library

by Don Weaver

The Centenarians of the Andes focuses on the Vilcabamba area of Ecuador where, as of the early 1970s individuals of extraordinary old age and good health are fairly common. A number are pictured: from 96-year old Manuel Patino out repairing his fence, to Victor Maza, 120, hoeing his corn, to Samuel Rochas, 142, playing his guitar while surrounded by children, and the oldest person according to birth certificate, is Jose Maria Torres, aged 150 years. There are women centenarians as well.

From the book: "Local legend says that the valley was the true Paradise from which Adam and Eve were expelled. It still retains from that Paradise the purity of the atmosphere, brilliant sunshine and crystal clear sky." (p. 35) And that is not all: "It is believed that the sand that forms a large part of the subsoil, at least in the Vilcabamba Valley, was caused by many big rivers and glaciers bringing deposits into the plain, where the village now stands. This was at one time a lake bottom. The course of the rivers can be seen in the hanging valleys that have been carved out to form the five arms of a star, Vilcabamba occupying the center. They brought in great quantities of sand, gravel and silt, and with it calcium which is found also as a deposit, mingled to create this very fertile region." (p.31-32) And last quote: "Let us here, having stated the unquestionable importance of hereditary factors in longevity and discussed some of the laboratory experiments on animals in this field, summarize the factors we studied in the centenarians of Equador. In our investigation of environmental factors possibly accounting for, or contributing to longevity, we felt that undoubtedly the most exciting and significant single factor was the trace elements found in the soil, water and diet." (p.129)

As with the Hunzakuts and other long-lived peoples eating from mineralized soils, the diet was predominantly fresh fruit and vegetable foods eaten to meet the needs of hunger, the average Vilcabamban consuming about half the calories of the average Englishman, according to this book. Living near plants and the land, plenty of fresh air and natural exercise, supportive community and relative freedom from worry and stress are also typical of the "lifestyle" of the long-lived person. So, remineralize and love the Earth, live long and prosper!

Don Weaver, co-author of The Survival of Civilization, *produces the* Solar or Ice Age? Bulletin *listed in the* Resource *section.*

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takes some training and experience to properly interpret, it can then be used to determine microbial and enzyme activity in the soil, levels of friable verses stable humus, poor nutrient cycling, compacting, and so on. We view it as a cheap microscope for the farmer, and it is a good tool to evaluate your progress or failures in your soil building program. It should be used in conjunction with humus and organic matter testing. It gives a more complete picture of what is happening at the biological level.

Hopefully we are finally starting to see today that an integrated approach to practicing and monitoring soil fertility is the only solution. It is only by combining necessary lab testing, along with proper field observations and hands-on follow through will we see the desired results. Acknowledging that all factors affect one another, and that nature cannot be reduced to just one or two variables, enables us to evaluate our soils more holistically in the future.

Weather, Climate, and Planetary Health

by Don Weaver

"Theory: Greenhouse Effect Fattens Penguins" is a short article from Auckland, New Zealand appearing in the local *San Mateo Times*, 8/17/93 which says:

> *Scientists plan to weigh more than 100 penguins to determine if the birds are getting fatter as an indirect result of the "greenhouse effect." Researchers from New Zealand and the United States National Science Foundation will set up weighing scales at three colonies of adelie penguins in the Ross Dependency next year.*
>
> *New Zealand team leader Peter Wilson said today that fish and other food appear to becoming more abundant in the waters around Antartica, which is warming slightly.*
>
> *It is widely believed that the warming is due to the "greenhouse effect" – a phenomenon caused by an increase of carbon dioxide in the atmosphere that traps heat from the sun. Burning of fossil fuels is one source of the carbon dioxide.*

When asked if he thought the "fattening" of Antarctic life was due to accelerated glacial grinding, John Hamaker responded: "Yes, the glaciers are advancing and carrying the dust with them. The thrust of the glaciers has broken up the floating ice, increasing its total area with a lot of open water between the blocks of ice. The blocks of ice are now free to be spun off into the west wind drift to become icebergs heading towards the equator. The glaciers will keep making icebergs for 90,000 years. Antarctica is waking up from its interglacial nap. No matter how the facts line up, some idiots will call it the effects of the warming."

Another example of an article's title being somewhat misleading and at a glance supportive of the still up and tottering "Global Warming" concept is one from the German publication, *Amerika Woche* (10/2/93): "Am Nordpol Schrumpft das Eis" or "At the North Pole the ice shrinks." It says that although it is

Nature Hasn't Gone Mad; People Have

A letter from John Hamaker

In recent years, weather extremes all over the world have added up to rapidly accelerating climatic disasters. In the past year alone, we have seen disasters in the U.S. that have left a trail of record-breaking destruction: brutal floods in the midwest, Hurricane Andrew in Florida, a blizzard on the east coast more violent than any storm since 1888, crop-killing droughts across the south. Almost every year, the incidence of tornadoes rises fearfully to new heights. Elsewhere, the headlines are the same. Massive earthquakes in China and Brazil. Famine-producing droughts in some countries; torrential, flooding rains in others.

What's happening? *Life* magazine recently asked, "Why has nature gone mad?" How typical of "man" to blame nature for the chaos we ourselves create! We blame "nature" – the very entity we have tried so hard to ignore – in the name of science.

John Hamaker and Don Weaver are the co-authors of The Survival of Civilization.

What have we done to destabilize climate and create deadly weather extremes? First, some background.

The Glacial Climate Cycle

For about 10,000 years, we have experienced glacial cycles of one-year duration. The snow and cold of winter alternate with a summer sun, which melts off the snow and warms the Earth. In the summer season, we grow crops.

The one-year cycle goes on continuously. But what happens if a blanket of clouds appears over the upper latitudes, thus decreasing the amount of sunlight which reaches the Earth? The balance between summer heat and snow melt is upset. Each year, the snow deepens and moves further south. The weight of the deepening snow forces the glaciers to flow downhill to the oceans where they calve icebergs. Also, as the area of land covered with ice increases, the quantity of cold air increases. The result is cold, late springs and early frosts – and for us, growing seasons becoming dangerously shorter. Storms grow bigger, more violent, and there are more of them. Food production is reduced.

The above abbreviated description of why the climate changes from interglacial to glacial is also a description of the present climate condition of the Earth.

What causes these glacial cycles? To begin with, all life on Earth is manufactured by microorganisms. They get their food from the gases in the air and from the minerals found in the soil and the water. It is these microorganisms that make plant life possible, providing plant food when the plant roots extract the protoplasm out of the microorganisms. A similar process takes place in the water. Thus, the humble, invisible microorganism makes possible our entire food chain, from the tiniest plant to the largest el-

difficult to ascertain a trend from satellite weather pictures, meteorologists from Freie Universitat Berlin think the ice in the European Arctic Ocean is shrinking at a rate of 1% or more a year. As we read the whole article carefully, we discover that it is not really "more evidence" for "Global Warming" but again brings us face to face with the whole Hamaker Thesis. Quoting Amerika Woche:

It is not yet completely clear to the scientists what causes the diminishing of the ice. The causes are very difficult to understand when one considers the frequent cold spells in Alaska and North America. According to U.S. measurements, the ice sea between Greenland and Alaska has become about 5° C colder since 1950; there the ice cover is increasing. Also the Scandinavian weather station reports in the winter a clear cooling trend which seems to contradict the expected greenhouse effect. The air temperatures above the European ice sea have practically remained the same during the observation period (since 1969). The currently accessible data of the Soviet Hydrologic Services, which have been collected since 1954 on numerous drifting ice floes, even show a cooling down in autumn of 4.1° C and in winter of 2.4° C. A direct connection between atmospheric circulation and the disappearance of the ice is therefore out of the question.

Professor Mangreb Geb of the FU Berlin Workgroup on Weather and Climate Development explains the observed phenomena by the increased temperature of the tropics. There since 1977 the average annual temperatures close to the ground have increased by 0.5° C. The consequence would be that more warm Atlantic water, for instance from parts of the Gulfstream, is pressed into the Norwegian Sea where it is mixed with Arctic cold water. The north Arctic Ocean is today on the average 1° C warmer than 10 years ago.

Thanks to Renate Hageman for translating and sending this article.

"A global warming may lead to big chill" is a more accurately titled article via AP news service NY and found in the *San Mateo Times*, 7/15/93.

Periodicals also are starting to cover this, such as the early release of the Jan. 1994 *Earth* whose cover asks "Will Global Warming Cause Global Cooling?" After *Newsweek*'s "Return of the Glaciers" article (11/23/92) which even quoted John Hamaker, it seemed the standard "Global Warming" paradigm might be toppled under the growing weight of "better science" and the spread of interest in the wholistic-ecological view. Although that paradigm has a remarkable "ability" to perpetuate itself as it has in the past year, perhaps the new *Nature* article by 40 members of the Greenland Ice-core Project (GRIP) and the broad publicity it is receiving will finally lead to the proper consignment of "Global Warming" to the compost heap of history. Those who continue to use the term might well be asked,"Don't you really mean 'Global Climate Change?'"

Let's review some of the coverage of this *Nature* study, "Climate instability during the last interglacial

continued on next page

ephant. Without the microorganisms, humans would not exist.

If either the gases or the minerals are in short supply, the microorganisms have nothing to eat, and the life system must die off. At the end of the 10,000-year interglacial, it is minerals that are in short supply due to 10,000 years of leaching and erosion. The growth on the land dies; with less plant life to absorb carbon dioxide and other gases, the gases in the air begin to build up. Decomposing organic matter, firewood, volcanic emissions, and the use of fossil fuels have exceeded the the ability of the plant life to consume the greenhouse gases.

At the end of a 90,000-year glaciation period, the land and the ocean are loaded with ground gravel dust that is produced by the glaciers. With their food supply replenished, the microorganisms undergo a population explosion. This in turn makes it possible for the plant system to expand and consume more gases from the air, thus dragging the gases down to a lower level. With less carbon dioxide in the air, the cloud cover disappears and lets the sun get to the ice and snow.

The glacial process is very simple. The key to our survival is the removal of gases from the air until the carbon dioxide curve indicator is down to 280 ppm or less.

For several decades, I have been proceeding on the assumption that the fear of death was stronger than love of money. That question has not yet been answered, simply because the major news media are owned by the corporate structure, and because the government has sold itself to the highest bidder. The truth about the crisis we face is known only to a small group of people who do their own thinking.

We are 20 years late in starting a program to prevent glaciation. Now we have to turn back a glaciation already in progress – a much more difficult job. It may require reducing the carbon dioxide to something like 200 ppm.

Here we are, with a government no more capable of stopping the use of fossil fuels than it was 20 years ago. We have a mountain of debt and 250 million people suffering from malnutrition and environmental poisoning. We are burdened with laws which would prevent doing what must be done for a chance to survive.

I see only one way we can hope to survive. If the Clinton administration were to grasp the fact that nature has us on its endangered species list, it might be possible to make a good try for survival. They would have to do two things: Tell the people what the situation is, and then hold a vote with two questions on the ballot: 1) Do you want to try for survival? and 2) In order to survive, will you grant emergency powers to the president to enact the environmental and economic laws outlined in the book, *The Survival of Civilization*?

When one considers how fast the environment is deteriorating, and how fast the glaciation is advancing, one must conclude that starvation, death and chaos will spread rapidly all over the world before the year 2000.

Weaver continued from page 37

period recorded in the GRIP ice core" (7/15/93):

"New ice core data show climate instability" –

During the previous Eemian interglacial the Earth's climate was, on average, slightly warmer than it is today. But it was also much more unstable – as shown by new data from PAGES Greenland Ice Core Project (GRIP). The temperature changes that occurred then, inferred from oxygen isotope data, were dramatic and very rapid, with regional changes of more than 10° C over 10-30 years.

Changes in dust deposition rates, and in the ionic composition of the ice, occurred at the same time, indicating that there were regional (and probably global) reorganizations of ocean circulation and atmospheric transport processes.

Four main modes of climate are apparent in the full glacial/interglacial data set: the current climate, warmer than present, cool glacial, and cold glacial. For the past 10,000 years (Holocene), the climate has been anomalously stable in comparison to its fluctuations during the previous 250,000 years. The implication of these findings is that current GCMs (Global Circulation Models) may be unreliable guides to future climate changes; abrupt switches in climate may be triggered, rather than gradual global warming. (Global Change Newsletter, *7/15/93)*

"Study of Greenland Ice Finds Rapid Change in Past Climate" –

The findings suggest that the period of stable climate in which human civilization has flourished might be unusual, and that the current climate may get warmer or colder much more quickly than had been believed – in spans of decades or even less...

Commenting on the new research, Dr. Andrew J. Weaver of the U. of Victoria in British Columbia said that if the climate becomes colder, Europe would be covered with snow much longer. As glaciers advanced, they would reflect more of the sun's energy back into space, chilling the climate even more....The authors said they did not have an explanation for the rapid shifts; it was a mystery why the climate of the last 8,000 to 10,000 years had been "strangely stable."...

In a commentary, Dr. J.W.C. White of the Inst. of Arctic and Alpine Research of the U. of Colorado said it was "difficult to express the importance" of the reports on the ice findings. "Adaptation – the peaceful shifting of food-growing areas, coastal population and so on – seemed possible, if difficult, when abrupt change meant a few degrees in a century," he wrote. "It now seems a much more formidable task, requiring global cooperation with swift recognition and response." ...The research on the last period between glaciers is considered important because it may provide hints about the effects of rising levels of atmospheric gases, like carbon dioxide, that have a warming effect similar to that caused by the glass in a greenhouse. "As the last interglacial seems to have been slightly warmer than the present one," the new report said, "its unstable climate raises questions about the effects of future global warming." (NY Times, *7/15/93)*

"Ice cores reveal a climate of uncertainty about weather" –

If the Earth came with an operating manual, the chapter on climate might begin with a caveat that the system has been adjusted at the factory for optimum comfort, so don't touch the dials.' writes J.W.C. White, a geochemist, in Nature, *7/15/93. Most scientists are convinced that humans have, indeed, been fiddling with the dials lately. Nobody quite knows what the results might be, but new evidence reported last month by scientists who have analyzed layers of ancient ice gives a strong hint that they could be dire:*

"We humans have built a remarkable socio-economic system during perhaps the only time when it could be built, when climate was sufficiently stable to allow us to develop the agricultural infrastructure required to maintain an advanced society," wrote J.W.C. White: "We don't know why we have been so blessed," White continued, "'but even without human intervention, the climate system is capable of stunning variability."

The findings raise the frightening possibility that altering the climate, rather than simply causing a slow, gradual change to which human society might be able to adjust, might propel the planet over some threshold into a period of sudden, unpredictable swings between extremes of hot and cold.....Scientists already knew there were sudden, dramatic shifts in global temperature during the last ice age. And they had a theory to explain it: Sudden changes in the huge ice sheets that covered much of the continental surfaces, and extended far out over the oceans, could trigger the shifts. But now, it turns out that swings that are just as wide, and just as sudden, also occurred during the warm period between ice ages – the last "interglacial" period, called the Eemian. The problem is, there were no extensive ice sheets during the Eemian. So scientists will have to come up with a whole new explanation for such rapid changes in climate. So far, they don't have a clue. (San Jose Mercury News, *8/17/93)*

Many of the GRIP members have of course been provided with the "clues" in the Hamaker Thesis, and as is usual, don't discuss them "publically." They do acknowledge the 1979 Genevieve Woillard study of pollen evidence for rapid interglacial-to-glacial transition. They seem to be ignoring discussion of the Eemian termination which appears to be "sudden" – corroborating Woillard – on the graph shown on p. 218 of this *Nature* issue in the companion article by nine of the GRIP members (and two others), "Evidence for general instability of past climate from a 250-kyr ice-core record." As we've seen before, the climate researchers, instead of saying straight out that the growing greenhouse gas buildup may be "triggering" a jump into the glacial climate condition, prefer statements such as the concluding sentence in this article: "This emphasizes the question of whether the Holocene will remain stable in spite of the

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Another Year of Extreme Weather

by Don Weaver

1. "Eastern Pacific Hurricanes" – "The 1992 hurricane season in the eastern North Pacific Ocean was record breaking in more ways than one. The 24 named storms broke a record of 22 set in 1985, and the 27 tropical cyclones broke a record of 26 set in 1982. The year's total of 14 hurricanes was two shy of the record set in 1990 but easily greater than the seasonal average of 10 (calculated since 1966, when routine weather satellite surveillance began). And eight of the hurricanes were Category 3 or stronger on the Saffir-Simpson scale.... One hurricane, Tina, lasted 24 days – longer than any other North Pacific tropical cyclone on record." *Weatherwise*, Feb./March 1993)

2. "Tornadoes Hit New Heights" – "Severe weather in 1992, on the strength of two huge outbreaks – racked up a total of 1,293 tornadoes, far more than the old record of 1,133 set in 1990. The amazing total was largely the work of a record summer launched by a June 15-16 outbreak of 123 tornadoes – second only to the Super Outbreak of April 3-4, 1974. The June total of 399 was the most tornadoes ever recorded in a single month....Not surprisingly for a year of abundant severe weather, devastating hail also plagued the South and Central states in 1992. Two record hailstorms struck central Florida in March, the first causing $25 million in damage, only to be outdone three weeks later by a storm with a $60 million price tag. Kansas City, Wichita and Dallas also had devastating hailstorms... Most of the 20 tornadoes in December struck in California. In fact, the 16 tornadoes in California surpassed the state's annual record of 14 set in 1978.....The last touched down near Crescent City in the northwestern corner of the state at 1:30 a.m. (PST) on the 30th, ending a record year of devastating severe weather." *Weatherwise*, Feb./March 1992 special *Weather of 1992* issue)

3. "The Year of Killer Weather – Why Has Nature Gone Mad?" asks the cover and feature story of *Life*, Sept. 1993. The article begins: "This is how weird our weather has been: The three most damaging climatic disasters in U.S. history happened in the past 12 months. First, Hurricane Andrew devastated south Florida last September. Then, on March 12 a giant blizzard – which the National Weather Service calls 'the single biggest storm of the century' – swept from Florida to Maine, releasing more snow, hail, rain and sleet than any other storm since 1888. Finally, the relentless rain flooding the Midwest brought on what may be the costliest weather disaster of all. 'Taken together the storms do make one wonder if there are pattern shifts occurring in our climate,' says Elbert Friday, Director of the Weather Service. What's more, Friday will say what most meteorologists won't: El Niño, the mysterious heating of the eastern Pacific Ocean, is altering weather this year, while global warming may be causing other disturbances....Is our weather changing irrevocably? Friday says, 'We just don't know for sure. There is no consensus yet.' "

4. In the last double issue of ***RE***, many more weather and climate events were reviewed. This could easily be done again here if not for space limitations, but as *Life* notes above, 1993 continues to be full of "killer weather" not just in the U.S. but worldwide, including record cold and floods in Europe; flooding and landslides in Nepal (worst national disaster ever); wettest and coldest summer in large areas of U.S.; record early freezes; crops in Canada damaged; floods in China destroying 500,000 acres of crops, hail severely damaging 370,000 more; a "snow-out" of the September 13th Colorado Rockies baseball game in Denver; earliest snow ever in Texas on 10/29/93, and, as I type this on 11/1/93, record cold and snows in the Eastern U.S. with "unheard of" snow in Atlanta, Georgia. Record drought and extensive crop damage in the Southeast U.S. also "complemented" the flooded areas further north and east and the cool Central and West-Central U.S. and Canada.

5. What are U.S. President Clinton and Vice-President Gore (*Earth in the Balance* author) doing about Climate Change and the need to Regenerate the Earth? *The Detroit News* article (10/20/93): "Voluntary greenhouse plan ripped" gives some idea. Excerpts: "The program President Clinton unveiled Tuesday to cut 'greenhouse' emissions and stop global warming just doesn't go far enough, most environmentalists say...Most scientists say greenhouse gases such as carbon dioxide and methane trap solar radiation in the Earth's climate to grow dangerously warmer. The Bush administration had sided with the skeptics, but Clinton Tuesday made his concern clear. Presenting his Climate Change Action Plan at a White House ceremony, he appealed both to businesses and individuals for help, saying: 'We simply must halt global warming. It is a threat to our health, to our ecology and to our economy.'

The plan's goal, he said, is to reduce the nation's emissions of carbon dioxide and other greenhouse gases to 1990 levels by the year 2000. But Clinton's plan relies mainly on hopes of voluntary cooperation from business and industry. It calls for $60 billion in private investment in energy-saving programs – encouraged by federal programs to increase energy efficiency – and $1.9 billion in federal spending, most of which would be redirected from existing programs... Despite the criticism, Clinton's White House audience – made up mostly of utility and business representatives – seemed pleased."

6. In contrast to the insanity above, consider the following letter

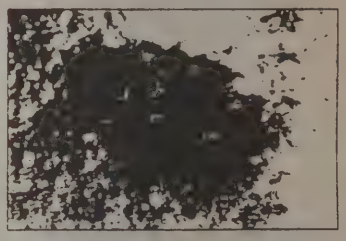
of a Puyallup, Washington high school student, written to Joshua Blue of Hawaii Soils Research/Save Our Soil, dated May 1, 1992:

"Dear Joshua Blue, I am a student at Puyallup High School. I am currently in Mr. Wuersten's environmental science class. This week we watched the video you sent to us, *Stopping the Coming Ice Age*. I am writing to thank you for this eye opener. There were many kids in my class that told kids in other classes about the movie and the next day we had people trying to get into our class to watch the video. During the class period, everyone was talking about how they wanted to go out right away and start spreading rock dust. This video was very educational and interesting. It got everyone's attention. Thank you for sending us this video so that we can understand what is happening to the world and know what we have to do to prolong or stop the ice ages from destroying the world. Sincerely, April Jones."

7. Another heartening response to the increasingly obvious need for a remineralized and re-greened Earth came to me recently from two other caring young people, Ocean Robbins of YES (Youth for Environmental Sanity!) and father John who founded EarthSave and authored the outstanding best-seller *Diet for a New America*. They've requested assistance in putting in a new remineralized orchard and garden at their home near Santa Cruz. I may be assisting other friends to do the same this winter in Hawaii, and I hope to do a lot more of this "hands on" Earth Regeneration work the rest of my life. I hope to have further "Green Progress Reports" for ***RE*** readers. Lastly, I hope all who can will join the work in this way and in all ways needed. Listen carefully and hear your special "calling." Thank you!

WORLD HEALTH
CARBON DIOXIDE
&
THE WEATHER

by Jesse Reklaw



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growing atmospheric pollution." And consider the conclusion of "Climate instability during the last interglacial period recorded in the GRIP ice core" which refers to another ice core, the analysis of which may enable stronger statements:

> *As the GISP2 drilling nears bedrock, we can rapidly expect both confirmation of these findings and new clues as the sister cores are subjected to closer scrutiny. The analysis of new parameters should allow us to narrow down the range of possible changes in ocean and atmosphere that favoured instability in the climate. Coordinated analysis of the two cores should allow much firmer dating than has hitherto been possible in any single ice-core, and remove beyond reasonable doubt any question relating to local interferences on the records. Jointly, they may provide the vital clue to answer the question of what it might take to induce Eemian-type instability into the Holocene pattern of climate. Man is already perturbing one of the factors that may be involved, the greenhouse gases, and our first tentative measurements indicate that they may be linked to climatic changes within the Eemian.*

Moving on to other articles, consider this revelation from "That Hole in the Ozone Layer" (*Popular Science*, Jan., 1992, p. 65):

> *Last June, scientists from the Commerce Department's National Oceanic and Atmospheric Administration (NOAA) and the University of Colorado and University of Wyoming said a major climate change may have occurred in Antarctica in the past 10 to 12 years. Their conclusion was based on a recorded change on ozone levels together with an increase in cloudiness over the South Pole. They report that* surface *ozone at the South Pole during December through February decreased 17 percent from 1986 to 1990, while cloudiness over the Pole has increased approximately 25 percent since about 1980. These changes are distinct from the seasonal ozone hole. But the researchers consider it "noteworthy" that all three began within a fairly short time frame – 10 to 12 years ago.*

That's a mighty strong word, "noteworthy." Excuse me, but *25% increase in cloud cover in 13 years!!!*

Nearly all of these events received coverage in the *Weekly Climate Bulletin* recommended last issue to all who wish to keep up on planetary events, available free on request.

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W/NMC53
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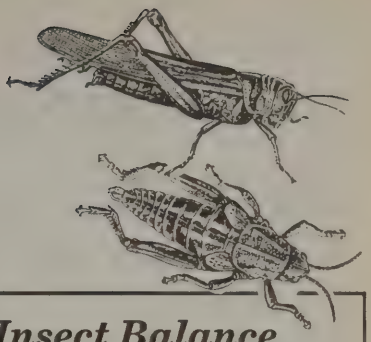
Washington, DC 20233

Gravel and Rock Dust Sources



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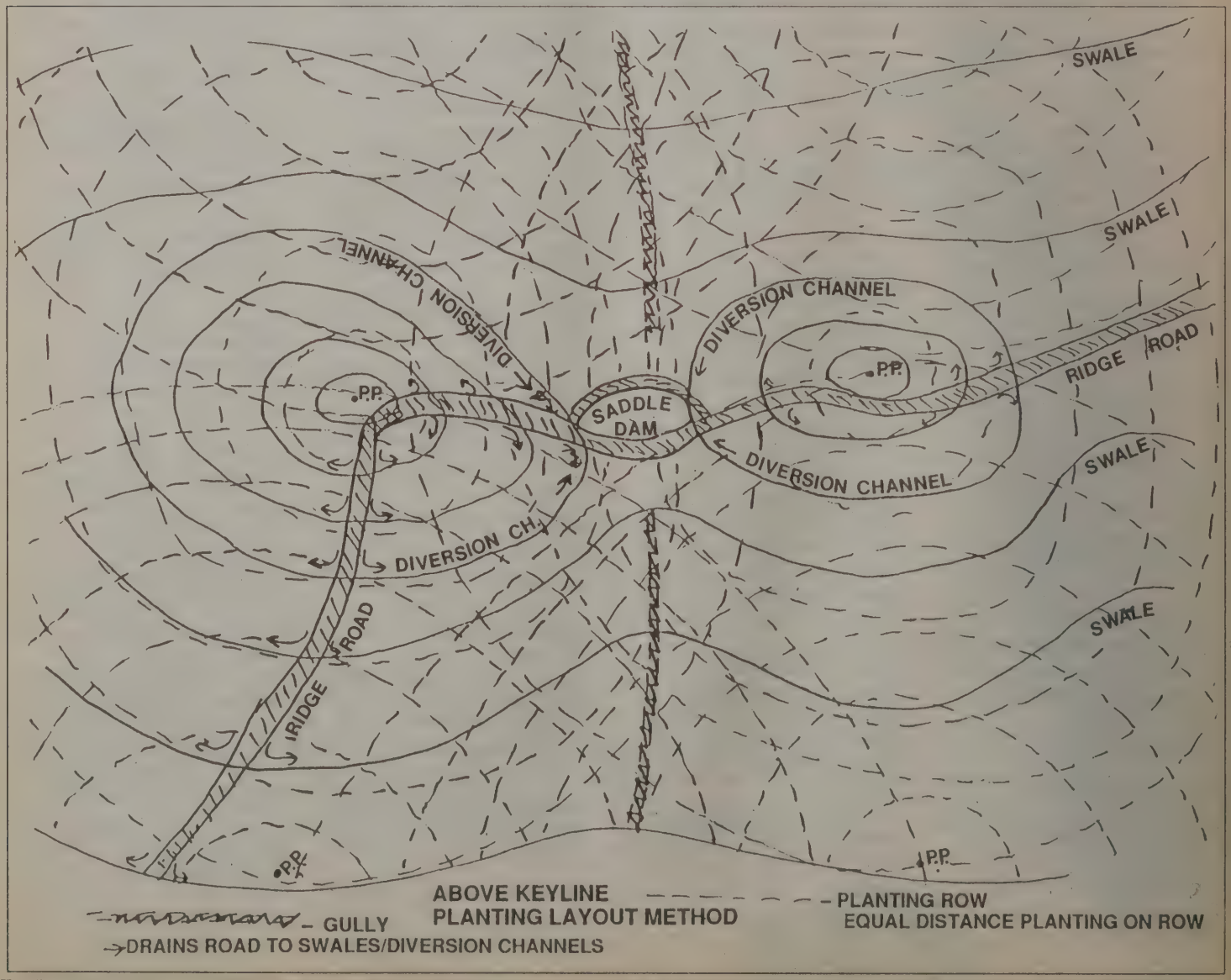
Ground volcanic dust.

SR with SEA WATER

by Dan Hemenway

Simon Fell, an Australian permaculture design practitioner and promoter of long standing, reports success in tropical Australia with a reforestation technique that incorporates remineralization using diluted sea water.

Readers no doubt recall that tropical rain forests on old soils (as opposed to those formed through relatively recent volcanic activity) hold very few fertility minerals. In these soils, most fertility minerals are held in living organisms. When the rainforest is cut and burned, or hauled away as timber, the minerals are lost to leaching, runoff or mechanical export. Once deforested and depleted, such soils generally support only scrub regrowth with scant succession toward renewal of a complex forest like the one that had been destroyed.



Fell told me that he achieves good regrowth using only nitrogen-fixing trees and sea water to restore fertility. Nitrogen-fixing trees are a standard component in tropical forestry and agroforestry programs. However, the use of sea water to restore fertility is more unusual. Fell says that for about every fourth or fifth irrigation he mixes sea water with fresh water at a dilution of about 1:20. Lush growth of planted trees results. Apparently repeated applictions of the dilute minerals in this slightly saline irrigation water replace minerals lost through deforestation.

The optimum dilution and frequency of seawater application presumably varies with soil, climate, and the complex of tree species planted. Trials in localities with convenient access to sea water may provide a useful alternative or supplement to rock powders in many locations where the rocks are not available. And of course pumping sea water can be done with almost no negative side effects and for little cost compared to the energy, equipment and transport cost of the rock grinding and distribution process.

RE readers living in temperate areas near oceans may also consider dilute sea water as a source of trace minerals. Please use caution in diluting sea water to avoid salt buildup and please experiment on small areas which can be conveniently leached with fresh water if soil salinity becomes a problem. The strategy holds promise in Mediterranean areas. Bear in mind that arid soils are much more prone to salinity buildup near the surface where seedlings and feeder roots of older plants can be killed.

Of course seaweed has long been used as a safe source of fertility minerals. Salt marsh grasses, harvested with judicious concern for marsh ecology, can serve as mulches which may well contain a rich mix of sea-borne trace minerals. Cutting vegetation over-stimulated by sewage discharge may actually help remove excessive nutrient from the marsh, however, the resulting mulch needs to be tested for heavy metals and other toxics which may have also been a component of the sewage. Some larger lakes, such as Victoria in Africa, are experiencing an increase of salinity as a consequence of large scale deforestation. Possibly reeds from such lakes can furnish a mineral-rich mulch to improve results in reforestation efforts. Mulching drastically reduces risk of salt build-up. Trees, once large enough, mulch themselves with litter and harvest water from mists which rise from the lake. Then, trees manage salinity without further mulching in most, if not all, instances. This follows a well worn permaculture maxim: "The problem is often the solution."

Fell's reforestation strategy involves planting trees along circular curves at an even spacing. "Plot points or center points for these arcs are located at the high points of the land and at a lower point on the slopes where the ridge spur line intersects the keyline." (For a discussion of keyline, see ***RE* #2**) The curves intersect as shown in the diagram forming a moire pattern expressed on the landscape as an un-

THE FARMER: WE WASTE NOTHING

Mission Indians, California, circa 1920

These Indians grow up on their farms. They Know the secrets of the soil they work on. I was interested in what I saw. These Indians grow fruits: I saw the largest apricots and grapes ever grown on this farm. I asked Black Owl what produced these fine fruits. I saw sweet potatoes that weight six pounds; I had never seen anything like it before. So you see, after all, *I Knew nothing.* These People could teach a city-being something. How strange – we often think we Know all, and we Know so little.

Black Owl said, "We waste nothing."

They have a wine season. After all the juices are taken from the fruits, the dead portions are used as fuel for the *earth.* I noticed he had bags containing something that looked like White sand. So I thought I would ask him one more Question. I did. And when I was told that it was sand from the bed of the Ocean [I asked]: "Why the sand from the Ocean?"

It was because of its salt and *mineral* content. "We mix this in the earth and that is why we have a fine soil for growing. Our subtropical weather is our next Great Cause, Miss Wa Wa. Old tree stumps are burned and we have enough fertilizer to feed our farm." [Black Owl said].

– from *Spirit Woman, The Diaries and Paintings of Bonita Wa Wa Calachaw Nuñez*
edited by Stan Steiner, Harper & Row, 1980
reprinted with permission of Harper & Collins

Dan Hemenway *is a permaculture designer, publisher and international distributor of permaculture publications, and teacher, leading workshops in many different ecosystems worldwide. Yankee Permaculture, P.O. Box 672, Dahlonega, GA 30533-0672.*

dulating density of trees. This provides a functional diversity of dense canopy and open areas which is very productive or other organisms which may be attracted to recolonize the planting.

I propose a variation from Simon's strategy. Instead of plot points on the high features of the site with strictly concentric planting arcs, I would plant along contour lines. I would retain the other system of arcs based on the low plot points. The result would further skew diversity of planting density to increase along steep contours, where trees more readily stack without shading one another, and, correspondingly, produce the lowest density of trees in the flattest areas, less prone to soil movement. Herbaceous plants can colonize these places.

Trees with more stringent requirements for water during establishment can be planted along contours, where they can be easily irrigated by connecting depressed planting basins with an irrigation ditch. This would permit a maximum of water penetration not only by irrigation but also by rainfall. Such trees might include agroforestry food species.

Trees planted along arcs generated by the low plotpoints would best be species which can establish with minimum irrigation since it would be necessary to irrigate the planting basins for these trees individually. A number of useful nitrogen-fixing species, for example, fit these requirements.

This design creates varied species groupings. After a few decades, those groupings which prove propitious could be emulated.

In a letter to fellow permaculturist Bill Mollison, Simon explains: "Advantages include a diversity of planting density with transition effect. The canopy will undulate in sine curves [waves] and dense canopy and open canopy and no-tree spaces will occur. The diversity will suit wildlife species. "Whilst suiting reforestation, the technique could also be used on flatter land (deserts, let's say) with grass/tree seed mix and sod seeder. Waves of refraction could be plotted around rock outcrops, waterways, etc., to create the desired edge effect."

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SPECIALIZING IN SOIL REMINERALIZATION

Permaculture & Remineralization

Dan Hemenway
Elfin Permaculture
P.O. Box 672
Dahlonega, GA 30533-0672 USA

There's more to remineralization than simply remineralizing. Considerations of wind, water, soil, climate, species and other factors can work with remineralization or undermine it. The same factors can mask research results or destroy their significance. Demonstrations of remineralization become meaningless if all of the factors pertaining to plant needs, preferences and uses are not considered.

Permaculture focuses all of these factors into a single, synergistic design that unfolds over time. As a long-time contributor to ***RE*** *and teacher of permaculture worldwide, I am offering my services as a designer and consultant to readers of* ***RE*** *to contribute to your remineralization projects.*

Letters and Forum

INTERNATIONAL

From India

We are now looking into the possibility of soil mixing; there is some marl available close by and this should help in the acid red soils of Auroville. Dolomite is also available now. Some trials will start this season. As for the alkali/saline black cotton soil here, I cannot find any affordable source of basalt. We use gypsum to balance the soluble salts.

I got three rock dust samples from the States. Rado Rock dust and Elemite, which did very well. Rado Rock dust also did very good. I never had results like this with samples from here! Elemite I ate, taking a spoon every day. Now my stock is finished.

Just today a friend came and mentioned that there are plenty of stone quarries 5 hours drive from here. There seem to be a great variety of rocks in that area. This has to be explored. In short it (SR) goes still on. We have shown the video again yesterday evening.

Some of the addresses I found in ***RE*** never replied to my writings. I thought this last issue was really the best.

Bernard
Auroville, India

SR in the Tropics

I grew up in Barbados, West Indies, where I am developing an organic farm. It is a coral island, so I'm very interested in (SR) application and availability. Do you know of any people or groups concerned with SR in the Caribbean?

David Cooper
Arcata, CA

I have been a tropical agriculturist for 25 years, mostly planting for Cocoa, Rubber, Coconut and Palm Oil; I am very interested in SR, which aims to save our planet from the devastating effects of chemicals.

I would be grateful for information or papers on the latest developments, especially concerning the tropics. Many thanks.

Man-Yin Ng
30 Longburn Rd.
Henderson, Auckland, Australia

Would Like a Job in SR

I have just watched the video *Stopping the Coming Ice Age* and also read the book *Secrets of the Soil*. I feel impelled to work with publicising this vital information, helping to create a massive demand for rock dust, and any other means to reverse the dangerously high CO_2 levels.

I am writing to ask if anyone in your organisation has any suggestions of opportunities for me to work in these areas, irrespective of location, and whether paid or unpaid, especially in Europe.

Having run my own health food wholesaling business for ten years, I have a good grounding in all areas of business management, from marketing and sales to financial controls. I have a good educational background which has been biased towards the scientific and technical, and I have H.N.C. Electronic Engineering. I have read very widely on many areas of health and healing, from the more 'esoteric' such as kinesiology, geomagnetic stress and 'vibrational medicine' to the more mainstream such as nutritional medicine, in which I have had a special interest since age fifteen. (I am now forty-six and very fit.) I also have special interests in writing and innovative 'problem solving'.

Alan Selkirk
92 Mountview Road
London N4 4JX, England

Talking Trees

We are in our second year in trying to save a dying Ash tree at Glastonbury festival. So far we have used positive energy and thoughts. We have for some time been interested in the idea of remineralization being fundamental for healthy growth. We are actively involved in trying to spread an awareness of the ever increasing death of trees in this country and ways of reversing it; we also record and transmit the inner sound of sap moving through trees. We will be doing this at Glastonbury this summer. We want to give every possibility in our efforts to save this tree as it could be a role-model for many more.

Buster Nolan
"Talking Trees"
127 Rosemary Ave.
Braintree Essex CM7 7TB, England

FROM THE U. S.

About a year ago I read an article on rock dust in *In Good Tilth*. I am very interested in collecting research and information concerning the uses of rock dust in both agriculture and forestry. Specifically, I am interested in the use of rock dust in the prevention and treatment of an Asian fungus currently killing all the Port Orford Cedar and Incense Cedar in our area.

John Fricker
Selma, OR

I am trying to find seed from trees or seeds from fruits and vegetables, that will yield a crop in the first, second or third years. I have been thinking of those trees, mentioned in the *Bible*: Fig, Pomegranate, Olive, etc. I've heard figs can begin to yield a crop in the first year. And the crop becomes more plentiful as the tree ages and grows. Additional trees may be the Jujube date tree. Quinoa may be a good grain to plant. It is reported that deer will not graze it because of its bitter coating. Of course, for a remote location, this represents an outstanding benefit.

The property will be arid or semi-arid. Irrigation will be nearly impossible, except for natural rainfall. I have thought of using a South African technique of digging a hole the size of a plastic trash bag (approximately 33 gallons). I would then line the hole with the bag, so it could trap rain water. Close to the bag I would plant a seedling tree. Perhaps I could also plant Quinoa seeds around the bag, hoping they may grow whether or not the seedling lives. I need to do this on a minimum of twenty acres. I will be most appreciative of any help and suggestions you and readers have to offer.

Bob McKasson
124 Thirty First St.
Newport Beach, CA 92663-3004

Thank you for sending the magazine. It's great and what I have been looking for for years.

Living in Florida where the sandy soil is so depleted is a real challenge. I've just got onto a source of rock dust, green sand, etc., through our organic gardening club. I will be in contact with the Earth Regeneration Society, Inc. Thanks for the data in your magazine. Did you contact Jarret Buys? He is giving seminars on remineralizing the Earth and spreading the word.

Valerie Harding
Clearwater, FL

RE – Unscientific Approach?

Frankly, I must say that I find your approach a bit too unscientific for my taste. Although the question of micronutrient fertilization is of great interest, the whole concept of grinding and spreading tons of rock dust per acre, when a few pounds of micronutrients would do just as well, is not very defensible. Perhaps a hybrid approach would make us all happy: use rock dust from rocks high in the particular micronutrients most needed. That should save on weight (by a factor of a thousand?) and costs (by a factor of a hundred?) and help the plants just fine. Of course, we need to identify which rock dust to spread where.

John R. Benemann, Ph.D.
Walnut Creek, CA

Editor: Please take a look at the Research Packets; *almost 200 pages of scientific studies.*

I would like to point out a very good book, *Clean Culture,* that got me started (on SR) and is one of the finest. Available at *Health Research*, P.O Box 70, Mokelumne Hill, CA 95245. Author originally was Sampson Morgan, pioneer of the organic movement, after 40 years experience. He published the first book in 1908. Cost is approximately $6, but I don't have a recent catalogue.

Jacob S. Overholsen
Ontario, OR

Editor: Please see the Resources *section for more information on the above-mentioned book,* Clean Culture.

I am writing in regards to an article which appeared in *Smart Money* magazine. I would like to apply this principle of using SR to my flower and vegetable gardens.

Mark Liszewski
Lancaster, NY

Praise for Rico Verde

I'm struggling to progress as a capable gardener – it's coming along beyond my imagined results. Much gain is due to learnings from your publication, also much success due to John Jeavons' work.

Trying to get on track with SR and having no success so far with local crusher fines on my first try, nor with Park's Elemite. I desperately said "Clod Buster was ok for John Hamaker – if I can't get results with that, I must get put out of our movement!"

I wrote to Col. L. Taylor and he gave me a grand discount for pickup of 50-pound sacks at the mine in Cuba, NM. I picked up four 50-pound sacks of *Rico Verde* hi-nutrition material – soft, crumbly, rocky-earthy stuff – dissolves in water. Results showed on my garden within hours – the plants leaped up immediately. My garden was good from Jeavon's works, and I used their seeds this year also, but Rico Verde made littler plants grow fast and all became stronger and grow more vigorously. Leaf growth on melons very obvious in 1-2 days. I really got this additive for my dying apple trees and have them treated now. Col. Taylor believes the soil is simply worn out deep down. I also suspect the ditch water is not reaching roots and I'm going to rework my ditches.

Janice Blue
Santa Fe, NM

Ordered some BioPlus glacial rock powder and plan to use it as soon as I can. Ordered Elemite rock dust 4 Feb. 93 – sent check. No response, so cancelled payment as of 6 May. Several calls – no results.

Have used Clod Buster, NutriCarb, BioPlus and some other dust that I bought from the person in Oklahoma, seaweed, kelp meal, Spray-N-Grow, soft rock phosphate, high calcium lime.

Did have good results from growing tomato plants in February-March this year. No dust involved. I give credit to paying attention and providing plants with heat, light, roots starting stuff and accelerated propagation system (APS 6) provided by Gardener's Supply Co., Burlington, VT, and seeds by Seeds of Change, Santa Fe, NM, Heir-

loom Seeds – Oregon Spring, Burbank, Brandywine, Double Rich. By 31 March had eighteen plants 10"-12" tall.

Neil Kinsey's soil report was good except for several micro nutrients.

Gave twenty-four tomato plants a nice helping of pulverized Nutri-Carb (coal) the other day.

Leonard Ridzon ad in *Acres, USA* May 1993, page 40: "How much NutriCarb to use? When in rotation, NutriCarb is applied at a rate of 500 pounds (per acre) plow down and 500 pounds on top immediately every seven years, and using NOTHING ELSE. This makes it a very inexpensive way to improve your soil." Five hundred pounds per acre translates to 5 pounds per 100sq. ft. in this garden. However, I side dressed each plant with about a cup of pulverized NutriCarb. Used Vitamix (juicer) to pulverize the coal; dust everywhere. No wonder the miners die of black lung disease! Keep up the good work.

George M. Myers
El Paso, TX

I have *delighted* in your magazine. I have been searching a long time for such info, but didn't know exactly what to look for or ask for. Since I attended the Nitron Co. "Organic Growing" seminar last October, marvelous gates opened to me all over the place! I have met and talked extensively with Phil Calahan and Arden Anderson, Howard Garrett and Andy Lopez and many others. Life has become ecstatic for me! And thanks to you it continues as a channel for more current happiness.

Yesterday I received 57 bags (35 lbs. each) from Rod Lertola of Bio-Plus, and will disperse it in part to others. A few of us are very hungry for this knowledge. We have had a snowfall of 16" recently, something unheard of here! But being a northerner except for the past fifteen years, I saved all my garden even though temps went down to 10°F. My gray wolf, Meeza, was ecstatic with the snow, but there was damage to my link fence from neighbors' falling trees. Our electricity was off for most of two full days, but I have a miniature cook stove in my "hobby" barn with plenty of seasoned red cedar and oak wood.

Can you imagine, today it's 66°F, my garden is beautiful but every one else's is gone. Well, that's northern ingenuity for you.

Frances Lanséros
Certgeville, AL

I appreciate too your immediate answer and the addresses of gravel sources and Costa Rican contacts.

Relating to an article in ***RE*** Spring 1993, I would like to comment on the phenomena that cows in Australia waited to drink muddied water from the daily cleaning of quarry equipment instead of the clear water in the stream closer to them.

Even some people are known to eat dirt. But physically, no animal (or human) is able to assimilate inorganic minerals. Over 70 yeas ago, the German scientist, Abderhalden, proved already that inorganic and organic minerals have the same composition; even though inorganic iron may be absorbed into the body, it remains unused in the tissue while organic iron is utilized in the formation of hemoglobin. Abderhalden concluded also that any apparent benefit of the inorganic mineral resulted from its stimulating effect.

One of life's laws is that of dual effects. As an example, when anything is taken for stimulation in the primary action, the secondary reaction is depression. The coffee drinker has to take an additional cup to "conquer" the depression. An addicting habit is formed which cost us much of our vital energy. In fact, we shorten our lives.

Renate Hageman
Crescent City, FL

Editor: Previous issues have reported on a rock dust health supplement in Austria called Superbiomin, which is now sold in 6,000 pharmacies in Germany, Switzerland, and Austria. A book has been written on its healthful effects and is listed in the Resource *Section. We also reported that after Chernobyl, the Russians trucked 2000 kilos of Superbiomin to treat radiation victims, as it has been shown to take radiation out of the body.*

John Hamaker, myself and many others have taken small amounts of talcum-fine powder internally, from 1/4 to a teaspoon a day. The owner of Azomite, Rollin Anderson, took Azomite daily for over forty years and lived into his nineties. I have taken both Superbiomin and Azomite. (Azomite is no longer marketed as a health supplement.)

Hamaker says in The Survival of Civilization *that the microorganisms in the intestinal tract respond to the mineral nutrients in the same way they do in the soil. The healthy microorganisms thrive. Assimilation of the mineral nutrients comes about indirectly through the microorganisms to us, just as healthy microorganisms create fertile mineral rich soils, and the minerals are made available in an assimilable form to plants.*

The ideal would be to get our minerals from highly remineralized plants. Blue-green algae is such a source of minerals and an excellent health supplement. Trace-Lyte is an electrolyte mineral supplement also designed to provide the minerals that should be in our foods, but at present are not.

Hopefully all vegetables and fruits will one day be highly remineralized and provide us with all the mineral nutrients needed for optimum health. As we remineralize the Earth, we remineralize our bodies and transform our health. Remineralization should be part of Clinton's Health Plan.

And the Controversy Goes On...

I read with considerable interest the responses to Harvey Lisle's "cosmiculture" article. I think Greg Stout correctly pointed out that Harvey may lack a mastery of certain technical subjects, such as enzymes. However, I, for one, do not think "science" has come very close to understanding the mysteries of life processes, especially in regard to health and nutrition. Certainly we should apply the findings of science when appropriate, but if we want truly healthy soils, crops, trees, bodies and planets, I think we must try to understand and work with the "forces" Harvey speaks of.

My own notion as to why rock dust applications sometimes seem ineffective is that we often do not match the dust to the nutritional needs of the soil life. As Harvey

implies, I do not think a chemical analysis of dust and soil helps very much except when there are gross deficiencies. Despite what Col. Taylor seems to believe, a dust which gives spectacular results in some soils does not make it a "magic bullet" for all soils. A more appropriate analysis would ask, "What types of dust would feed the desirable organisms actually present in the soil?"

The soil life is the potentiator through which the dust feeds the plant. Without the appropriate organisms to "latch onto" the dust particles, the fine ones will leach down below the (potentially) biologically active soil strata. And the coarser particles that don't leach will take a long time to be broken down and become available "food."

I have seen this myself when applying high-calcium lime to our property. Our backyard, which has not been chemically farmed, has an abundance of soil life evident in the rich, dark earth and plentiful earthworms. The crop land next to it is considerably lighter in color and deficient in humus and worms. When I applied high calcium lime equally over the two areas, the backyard exploded in clover while the crop land did not. No clover has been planted in either area for at least 15 years.

I think this happened because the soil life in the backyard "grabbed" the lime particles and made the necessary minerals/colloids/electrolytes/whatever available to stimulate the germination of long-dormant clover seeds. Also, it may be that the paramagnetic qualities of the lime were an important aspect of its attraction to the soil organisms. Thus, it may be quite important to educate the readers of ***RE*** about paramagnetism (although I would certainly recommend *Acres, USA* to them as well – it would have been nice if an address had been provided!)

Since many soils today have been chemically sterilized, it may be that we even need to add certain kinds of bacteria, fungi, algae, etc. along with our rock dusts in order to get the soils biologically active again. This has a parallel in human health when we take acidophilus to replenish the gut bacteria destroyed by antibiotics and poor nutritional habits.

Also, much research is needed to determine what kinds of organisms occupy various farmed-out soil types and what the microbiotic succession patterns might be. That is, which organisms need feeding at what stages in order to speed up the natural processes of soil building? I think there is probably a parallel with the stages of different occupations of plant species when Nature takes bare soil back to deciduous forest, for example. Since I don't want to wait 200 years for Nature to do it, I need to know which rock dusts will feed the organisms I want to encourage at the particular succession stage they're in and in the particular soil I'm working with.

Recently reprinted articles in *Acres, USA* by Sam Hood probing the symbiotic relationships between soil fungi and plants and other organisms show some of the paths we need to explore. With all our technological prowess, it seems to me we have just barely reached infancy in our understanding of soil nutrition and, as well, human nutrition.

As I said earlier, I think chemical analyses are of limited use to "end users" like myself. "Science" hasn't been able to create life from chemicals despite monumental attempts. At present the best tool I know of to match dusts and other nutrient materials to soils is the radionic scanner (another subject frequently found in *Acres, USA.)* I have seen enough results on my own farm, working with a scanner operator in Michigan, to know that it does work, and there is a considerable body of "scientific" literature, by Fritz Popp, Phil Callahan and others, to explain how it works.

Just because Hamaker/Weaver may not be familiar with a certain tool or don't recommend certain tests is not a reason for me to ignore them. Why do you feel bound to hold ***Remineralize the Earth*** within the framework of one or two person's discoveries? After all, aren't we trying to nurture the Earth and not a cult?

I do not think Harvey Lisle intended to imply that a "living" rock dust is actually alive, but that it promotes desirable soil life in the particular soil to which it is applied. We all desperately need to know more about this soil life and the "forces" and "foods" which encourage it if we are to succeed in restoring and revitalizing our sacred planet. I urge you to let ***Remineralize the Earth*** take up this larger mission and go out there and shake the bushes for more Harvey Lisles!

Gary Via
Quinton, VA

Mr. Via's example of the difference in the improvements in his no-chemical soils and in his chemically farmed soils to the high-calcium lime illustrates our emphatic objections to the concept of "miracle products" and "cure-alls" – which include single-source building materials.

"Taylor" definitely does not believe, as Gary stated, that "a dust which gives spectacular results in some soils does not make it a magic bullet for all soils." Only when all essentials "in plant-assimilable forms" are present in soils does the "spontaneous occupation by beneficial organisms" dependably take place.

Only in oil field cleanup work have we found it necessary to introduce specific strains of micro-organisms. Switching chemically sterilized farmlands from unsuitable environments to "scientifically completed environments suitable for the spontaneous occupation by beneficial organisms" is consistently done – but not, as Gary wrote, by the sole use of rock (carbonaceous shale) dust.

There are "monuments" (piles of geologically concentrated humus) scattered throughout the West, abandoned by those who attempted to do as Gary stated we do – "a dust which gives spectacular results in some soils...".

Sure, when say, a producer of organic table grapes calls us for help in turning a "set" but failing "pick" into a profitable crop three weeks before picking starts, we supply, "in plant assimilable forms" the mineral plant foods needed to complete the nourishment of those flaccid, sticky clusters into firm, high sugar, long-keeping harvests.

You have readers who are also sufficiently familiar with our concept of total soil management that they would detect the error in Mr. Via's statement. Such recognition would greatly weaken Mr. Via's otherwise completely acceptable arguments.

Leland B. (Colonel) Taylor
Agronics Incorporated
Albuquerque, NM

The Network

A Grapevine For Subscribers– to Network and Communicate with Each Other About SR

Rodney Barnes
25412 Browca St.
Hemet, CA 92344
(909) 927-8069

Gerry Birch
20 Courtlands Avenue
Hampton, Middlesex TW12 3NT
England
Organic allotment holder.

Joshua Blue
401 Palani Place
Wailuku, HI 96793
(808) 242-4578

Monroe E. Burton
1 Shepherds Lane
Whitehouse Station, NJ 08889
(908) 534-2903
I write articles about Natural Hygiene and related topics.

James E. Carroll, Ph.D.
609 Holly Hill Road
Johnson City, TN 37604
(615) 282-5779
Health & Nutritional Science. Interested in rebuilding our soils and preserving the plant life of our planet.

John Cone
World Center for Environmental Health
290 Harvard Street
Cambridge, MA 02139
(617) 491-6199
WCEH is an intl. educational foundation committed to a "Reverence For Nature" to ensure a healthy future for all species. Special emphasis upon rebuilding the ozone layer naturally through increased photosynthesis.

Bob Crawford
Kalaya Park
RMB 362
Albury, NSW, 2640, Australia
Tel. 060 266151
B.D. farmer, motel manager and fertilizer salesman. Would like plans of grinders, if possible.

Ato Tinsae Dubale
P.O. Box 195
Wollaita Soddo
Semen Omo, Ethiopia

Ted Dunlap
The Gentleman Farmer
2650 Blucher Valley Road
Sebastapol, CA 95472

Bertil Eriksson
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Citrus Heights, CA 95611
(916) 725-5073

Vincent B. Gay
Swampy Dell Acres
Rt. 2, Box 1350
Starke, FL 32091-9531
I am dealer for New Technology Colloidal Silver – $70 for shipping 4 oz. It kills bacteria, fungi & viruses. Non toxic. Good effects on bacteria and nematodes in soil.

Ronald Keith Gray
'Dunromin', NGA Kuru, R.D.1
Rotorua, New Zealand

Marilyn B. Green
1095 Pem Road
St. Louis, MO 63146
(314) 992-1418

Donald Guénen
707-520 St. Laurent Blvd.
Ottawa, Ontario K1K 4N1
Canada
(613) 741-1504
I am taking part in organic gardening and would like to spread the idea of remineralizing the soil.

George Hadley
Organic Kauai Produce
6335 Waipouli Road
Kapaa, HI 96746
Organic Market Garden. Soil Consultant

Kendall Harris
Cedar Ridge Farm & Hand Crafts
3237 Vicker Switch Rd.
Christiansburg, VA 24073
(703) 382-1482
Gelbich cattle and Coopworth sheep. Wooden furniture and other crafts. Trying to be organic and sustainable.

Daniel A. Jankowski
2231 S. 10th Street
Milwaukee, WI 53215-2755
(414) 671-0108
Interested in the possible effects of remineralization of local "white oak" trees would have on reversing a worsening chlorosis problem which is killing too many trees,

even young ones that twenty years ago were healthy & producing abundant acorn crops.

Van Lewis
Apalachee Ecological Growers
1841 Thomasville Road
Tallahassee, FL 32303
(904) 224-7300/904-386-6272 (H)
We network between organic growers in our bioregion, and wish to establish an organic farmer's market in Tallahassee.

The Light Pages
Patti Middleton
PO Box 3009
Boulder, CO 80307-3009
A local directory, free to the public, supported by advertising that showcases businesses, products and services which contribute to the well-being of the Earth and its people.

Harvey C. Lisle
4427 State Rt. 601
Norwalk, OH 44857
(419) 668-9632
Am using paramagnetic rock dusts in combination with biodynamics in gardening and fruit growing. Dowsing tells me which rock dusts are paramagnetic.

Tom Lonsky
R.D. 1 Ledyard Road
Genoa, NY 13071
Experimenting with grinder design and forest remin. Very interested in sharing info and results.

Tom Lucas
c/o PO Box 1107
Riggins, ID 83549
(208) 628-3937
Raw foodist, interested in permaculture, algae.

Scott Martin
PO Box 108
Naalehu, HI 96772
(808) 929-9637
FAX (808)-929-7160
I am interested in helping a very large manufacturer of sand and gravel on the Big Island (of Hawaii) manufacture and market basalt dust. Looking for anyone with experience or knows someone as an information source.

Timothy Masters
PO Box 3486
Kissimmee, FL 32742
Can toxic waste be neutralized with gravel and volcanic ash? Will it clean out the pollution and years of mismanagement of our wetlands? Can nuclear waste be rendered safe by mineralization?

Bill Milne
Alex Milne Assoc., Ltd.
376 Orenda Drive
Brampton, Ontario L6T 1G1
Canada
A Canadian source for rock dust. Also for compost enricher for reducing odours & fruit flies & carrying natural nitrogen through to garden soil, lawns, hedges.

Organically Green
72 Wanita Road
Mississauga, Ontario
Canada L5G 1B6
Interested in alternative fertilizing methods.

Jacob S. Olverholser
5580 Fog Road
Ontario, OR 97914-8038
(503) 262-3219
I have a rock grinder, a type of ball mill. It takes 3/4" minus rock and reduces it to 100-200 mesh. I am looking for source of rock at present.

Paul Overton
c/o The Levy Co.
P.O. Box 540
Portage, IN 46368
(219) 787-8912
The Levy Company is a major supplier of soil conditioning materials i.e., Ag-lime, Ag-Snag, pulverized fine grade aggregates.

Paul Reuter
P.O. Box 111
Lackawanna, NY 14218
716-822-2335
Just looking into the feasibility of starting something up locally.

Maer Rubley
Box 1084
Steamboat Springs, CO 80477
(303) 879-5733

Jerry & Trish Sandoval
PO Box 905
Chula Vista, CA 91912
We are retired, living south of Ensenada, Baja California, Mexico. At present have back yard planted in a garden with grapevines, arbor and composting area. Sandy soil. Very interested in org gardening and SR.

S. A. Rockdust Corporation
Shirley Francioni
PO Box 4167
Pretoria, TVL 0001
Republic of South Africa
Marketers and distributors of Rockdust
Day - 01461 2 8860 Walter Woosch
Eve. - 0121 57-5871

Simone Magyari Sebalo
223 Brush Street
Graton, CA 95444
(707) 823-5267

David Siegel
Neah-kah-nie
37350 4th St.
Nehalen, OR 97131

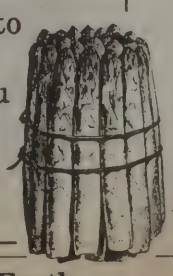
Sisson Library
Kate Terry
Box 849
Pagosa Springs, KY 81157
(303) 264-7209
Nationally recognized library.

Leland B. (Colonel) Taylor
701 Madison NE
Albuquerque, NM 87110
(505) 268-9206
I accept some good in most "alternatives" but have found no others with proved concepts of totality. Discussions invited.

H. R. Templin
76 49A Hewlett St
New Hyde Park, NY 11040

Subscribers are invited to join the Network Listing. Please contact us if you would like to be included. For a complete and current list add these to the lists in previous issues. You can be listed once a year.

***SR* – Soil Remineralization**



RESOURCES

Remineralize the Earth magazines

Remineralize the Earth issue #6 is available for $5.00 each.

- 2-9 copies at $3.50 each
- 10 or more copies at $3.00 each

Remineralize the Earth issue #3 and double issue #4-5 is now available in larger quantities at a special price *to current subscribers* for networking:

- 2-9 copies at $3.00 each (#3), $5.00 (#4-5)
- 10 or more copies at $2.00 each, (#3), $4.00 (#4-5)

Discounted for book and health food stores. Please contact us for prices. Some past issues are available for $4.00, though many are out of print.

SR Research Packets 1993-4

Soil Remineralization Agriculture Packet

This is a new and updated research packet on SR research around the world for agriculture and orchards. Spiral bound, 146 pp. See Price List on order form on page 55.

SR Forestry and Sewage Treatment Research Packet

Also new and updated. Spiral bound, 82 pages. See order form for prices on page 55.

The Best of SR A Network Newsletter 1986-1990

This volume is currently being organized and it should be ready soon. A collection of the best articles that appeared in the Newsletter over four years. Approximate price, $18-25.00 in the U.S. We'll send out information when it is ready. *Editor: This volume is still not ready, but we hope to have it ready for January, 1994.*

Hamaker Weaver Publishers

The Survival of Civilization

by John Hamaker and Don Weaver ($12.00 ppd.). This important book is the foundation on which remineralization and the grass roots movement rests.

The Solar or Ice Age? Bulletin

(366 pp.). Don Weaver has put together current events supporting climate change from the coming Ice Age perspective, including recent volcanic and tectonic activity, what's happening to forests, and weather as well as global networking of SR news. Suggested minimum donation $10.00.

Don Weaver, Hamaker-Weaver Publishers, P.O. Box 1961, Burlingame, CA 94010. Tel (415) 347-9693. *The Survival of Civilization* ($12.00 ppd.) can also be ordered from John Hamaker, Hamaker-Weaver Publishers, Rte. 1 Box 1490, Seymour, MO 65746. (417) 935-2116.

Video

Stopping the Coming Ice Age video

Complete 57-minute version by the late Larry Ephron currently available from Lynne Ephron Sarafian, 406 1/2 Laurel Ave., Menlo Park, CA 94025. Tel. (415) 323-4034. The cost is $29.95, plus $3.50 for shipping and handling within the U.S.

The video is also available from *The Video Project, Films and Videos for a Safe and Sustainable World, Catalog 1993,* in an edited 45-minute version for $29.95. 5332 College Ave., Suite 101, Oakland, CA 94618. Call 1-800-4-Planet.

Earth Regeneration Society

Whose World To Lose?

This volume is the first government level document setting forth a structure for the climate stabilization effort. Place orders for one book or bundles of copies.

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Earth Regeneration Society is an active and effectively organized network, stimulating and coordinating initiatives in scientific research and both governmental and non-governmental policy. They have available numerous scientific papers on climate and are dedicated to the

implementation of an Earth Regeneration Program. President, Alden Bryant and with Fred Wood Sr., Ph.D. and others. Earth Regeneration Society, 1442A Walnut St. #57, Berkeley, CA 94709.

Recommended Reading

Bread From Stones

The book by Dr. Julius Hensel and his pioneer writings from the 1890s on stone flour for agriculture, is now available from the ***Acres U.S.A.*** mail order bookstore. In addition to the classic text, *Acres U.S.A.*, has included comments by John Hamaker, among others. Softcover, 102 pages. Order No. 4024. Send $11 in U.S. and $12.00 outside U.S. postpaid). *Acres USA,* P.O. Box 9547, Kansas City, MO 64133.

Secrets of the Soil

This book by Peter Tompkins and Christopher Bird is a sequel to the now classic ***Secret Life of Plants.*** There are four chapters on remineralization. A fascinating account of recent breakthroughs – scientific and spiritual – that can save your garden or farm. This book is available, or can be ordered at your local bookstore. It is published by Harper and Row.

World Health, Carbon Dioxide and the Weather

World Health, Carbon Dioxide and the Weather by Jesse Reklaw is about how increased carbon dioxide will affect the future of the Earth. This book is available for $4.75 ppd. from C. Olson & Co., Post Office Box 5100, Santa Cruz, CA, 95063-5100. To order: (800) 366-5163.

Clean Culture

Author Sampson Morgan, pioneer of the organic "clean culture" movement which advocated the use of rock dust in place of manure, after 40 years experience. He published the first book in 1908. Cost is $8.50 postage paid (plus tax in Calif.). Available from *Health Research,* P.O Box 70, Mokelumne Hill, CA 95245.

Superbiomin with its 26 Mineral Elements for Human Beings, Animals and Nature

This book is available from Robert Schindele and Co. OHG, A-3122 Gansbach-Kicking, Austria. Tel. 02753/289.

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"SECRETS OF THE SOIL"

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